Electoral Systems and Real Prices:
Panel Evidence for the OECD Countries, 1970-2000

Ronald Rogowski
UCLA
rogowski@polisci.ucla.edu

Eric C. C. Chang
UCLA
chiache@ucla.edu

Mark Andreas Kayser
University of Rochester and
Nuffield College, Oxford
mark.kayser@rochester.edu

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ABSTRACT

The classic Stigler-Peltzman model, if extended to consider the effects of electoral systems, suggests (a) that majoritarian electoral systems should advantage consumers over producers and (b) that this effect will manifest itself in lower real prices. In an earlier paper, Rogowski and Kayser (*AJPS*, July 2002) demonstrated that, controlling for all other factors standardly adduced in the extensive "Law of One Price" literature, and for country size, the strongest form of majoritarianism, single member districts (SMD), predicted a ten percent drop in the real 1990 prices of the average OECD country. This cross-national effect survived a plethora of robustness checks and was not driven by any single case, including the United States.

We now extend that empirical analysis to panel data for twenty-three OECD countries over the period 1970-2000, taking advantage also of the numerous changes in electoral systems during that period (France, Italy, Japan, New Zealand). In a country fixed-effects specification (sustained by a joint test of significance on the country dummies), and particularly when missing data are addressed by multiple imputation, the electoral-system price effect is again confirmed as statistically and substantively significant. We suggest (a) that real price differences can serve as an important indicator of policy effects of various institutions and (b) that, given these results, any change in a country's electoral system will have strong and predictable effects on the balance of consumer-producer power.

In a previous article (Rogowski and Kayser, 2002), two of the present authors extended the well-known Stigler-Peltzman model of regulation to show that more majoritarian methods of election would logically entail: (a) greater political power for consumers, less for producers; and, as a direct corollary, (b) lower real prices. Cross-sectional evidence for the member countries of the Organization for Economic Co-operation and Development (OECD) in 1990 was strongly supportive, suggesting that real prices (measured, as is standard in the literature, as purchasing-power parity over exchange rate, or PPP/XR) were, controlling for all other influences commonly adduced (GDP per capita, trade barriers, exchange-rate stickiness, etc.), about ten per cent lower in the average OECD country with single-member district (SMD) electoral systems than in those that used some form of proportional representation (PR).

The present paper reviews the logic of the electoral-system price connection and extends the earlier empirical analysis to panel data for twenty-three OECD countries over the period 1970-2000. This allows us to control for country fixed effects and to incorporate the over-time effects of several within-country changes in electoral systems: the shift from SMD to PR in France (1986) and New Zealand (1994); and from PR to SMD (or predominantly SMD) in France (1988), Italy (1993), and Japan (1994).[1] The results strongly support the original conjecture and give us a better idea of how electoral-system change within a country affects consumer power and real prices: in the first year after a shift from PR to a majoritarian system, our results indicate, prices in the typical country will drop by about 3.5 per cent.

A first section briefly summarizes the logic of the Stigler-Peltzman model of regulation and the earlier Rogowski-Kayser extension of it to the domain of electoral systems. A second section discusses measurement issues, focusing on how one compares real prices over time and across countries and summarizing the large literature that has already addressed that issue. A third section analyzes the OECD panel data. A final section concludes.

I. The Stigler-Peltzman Framework and Extension

The pioneering work on regulation of Stigler (1971) and Peltzman (1976) yielded two insights that we regard as essential: (a) that what matters most for policy is politicians' *marginal rate of substitution* between producers' and consumers' support; and (b) that *prices*—or, more

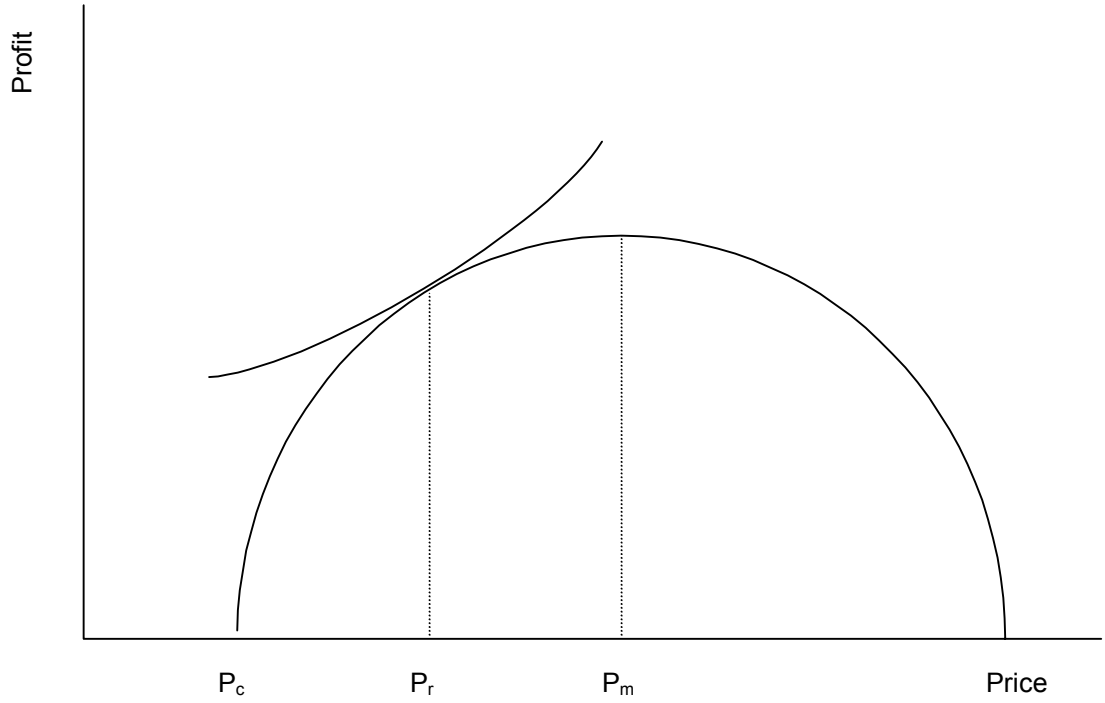
[1] We code Italy and Japan as SMD from 1993 and 1994, respectively, and New Zealand as PR from 1994 onwards. Results are robust to alternate codings.

precisely, departures from competitive prices—reliably indicate that trade-off. The basic insight of the Stigler-Peltzman (S-P) analysis of regulation can be conveyed by a single, widely familiar, diagram (Figure 1). Suppose that the price of a given industry's product is represented on the horizontal axis, its profits on the vertical one. Then at the perfectly competitive price p_c, profits will be zero. To the extent that regulation in any of its familiar forms—licensure schemes that artificially restrict supply, regulatory boards that set minimum prices, impediments to efficient retailing, tariffs, quotas, and so on — can raise price above this competitive level, total industry profits begin to rise,[2] until price reaches the level that a monopoly would impose (when, of course, marginal cost just equals marginal revenue and industry profit is maximized); this is denoted as p_m. If regulation becomes so restrictive of supply as to push price even beyond this monopolistic level, industry profits again decline, returning eventually to zero as the price becomes prohibitive.

Producers in the sector of course pursue p_m; consumers, p_c. Politicians, in the S-P framework, simply want to maximize support. They therefore consider the marginal rate of substitution between producer and consumer support, represented by a set of iso-support curves I_s. We depict in Figure 1 only the relevant member of this family, namely the highest one tangent to the price-profit "hump." The S-P prediction is, of course, that government will bring price (and hence profits) to precisely the level indicated by the point of tangency, denoted here as p_r, the "regulated" price.

[2] Absent barriers to entry, these profits of course will be competed away; but the same political power that imposes higher prices is usually clever enough to restrict entry. To the extent, however, that close substitutes for the given product or service are available, the price-profit “hump” will be lower (and, all else equal, the sector will be less attractive to politicians as an object of regulation).

Figure 1: Stigler-Peltzman Regulation



Now consider the iso-support curves (and the prices they yield) more closely. If producers are quite powerful relative to consumers in a given sector, the I_s curves will be nearly flat: for a politician to gain enough consumer support to compensate for even a slight decrease in industry profits, the price would have to decrease by some quite large amount. Conversely, if consumers greatly outweigh producers in a given sector, the I_s curves will be almost vertical: to compensate for the ire that even a slight price increase would arouse among consumers, profits would have to rise hugely. In the former case, logically enough, regulators impose almost exactly the monopoly price p_m; in the latter, they depart very little from the competitive price p_c. In this precise sense, price—or, more exactly, departure from competitive price—indicates almost perfectly the balance of consumer-producer political power in the given industry.

The earlier paper demonstrated that, under plausible assumptions, the isosupport curves would be steeper (all else equal, and assuming that no one party captured more than about two-thirds of the vote) the more majoritarian was the electoral system.[3] More specifically, policy would be more biased toward consumers – and hence prices would be lower – the higher the seats-votes elasticity, the percentage increase in seats that a party obtains from a one percent increase in its share of the popular vote. We followed Taagepera and Shugart (1989) in noting that PR systems, by design, produce a uniform seats-votes elasticity very close to one; while the typical single-member district (SMD) majoritarian system, under the Downsian assumption that two parties divide the vote almost equally, is characterized by a seats-votes elasticity of about 2.5. (The even more majoritarian bloc-vote system of the U.S. Electoral College has had over recent history a seats-votes elasticity closer to eight, suggesting – we think accurately – that in U.S. politics Presidents will normally be more pro-consumer than Congress.)

Cross-nationally, the model's prediction was (and remains) unambiguous: countries that elect their parliaments by the standard majoritarian method of SMD will adopt far more pro-consumer policies than will ones that use PR, whether in a "pure" (typically closed party lists in large constituencies) or an attenuated form (e.g., the Irish system of the single transferable vote, or the pre-1992 Japanese one of the single non-transferable vote, both in relatively small constituencies), since even the more attenuated forms of PR are typically characterized by seats-votes elasticities far smaller than 2.5. Empirically, the more pro-consumer policies should – following the Stigler-Peltzman logic – manifest themselves in the form of lower real prices.

Even more daring is the model's *intertemporal* prediction: that a *change* of electoral system within a country will quickly affect the consumer-friendliness of policies and the level of prices. A country that shifts from PR to SMD should experience higher prices; one that shifts from SMD to PR should see prices rise. But what do we mean by real prices, how do we measure them, and what control variables must be invoked in cross-country or intertemporal comparisons of them? Fortunately a large literature, most of it associated with discussions of the so-called "Law of One Price," has already addressed this issues, and we basically follow what appears to be its consensus.

[3] The full formal argument is presented in Rogowski and Kayser 2002. For quick reference, we present the core features of the model in Appendix A of this paper.

II. How to Measure, and Compare, Price Levels Cross-Nationally and Over Time

The standard method in the literature – including such popular literatures as the well-known "Big Mac Index" compiled annually by *The Economist* magazine -- for comparing price levels cross-nationally is known as "purchasing power parity over exchange rate," or for short "PPP/XR." It can readily be made transparent.

Suppose that some standard good or service – let us say, for simplicity, a man's shirt of a particular brand and size – costs $50 in the U.S. but that the identical shirt is marketed for €100 in France. Suppose also, as is currently roughly the case, that on exchange markets the dollar trades at parity with the euro. Then a French consumer (or, even more likely, a French merchant) could convert the €100 into $100, go to (or order from) the U.S., and get two shirts for the same money that would have bought him only a single shirt in France. In this precise, and quite meaningful, sense, the price of the shirt is exactly twice in France what it is in the U.S. In terms of purchasing power, at least in the domain of shirts, two euros are required to buy what one dollar can obtain; yet the exchange rate is 1:1. Hence PPP/XR = 2/1, and – as we have already seen – French prices are twice those of the U.S.

The standard efforts to compare prices cross-nationally, including particularly the International Comparisons Project (ICP) that produces the Penn World Tables, simply broaden this exercise to compare PPP/XR with respect to broad "baskets" of goods and services, of the kind that are familiar from calculations of consumer price indices. If the broadest possible "basket," representing all of the goods and services that a typical economy might consume, costs (let us say) €5000 in Italy but $3000 in the U.S., while the euro-dollar exchange rate is 1:1, then we can say that the overall price level in Italy is 5/3, or 1.6 times, what it is in the U.S.[4] If that identical basket costs 24,000 kronor in Sweden, while the krona trades at 4:1 against the dollar, then Swedish prices are 8/4 = twice as high in Sweden as in the U.S.

In theory, any substantial cross-national price differences (at least as regards tradable goods or services, and absent import restrictions) should be quickly arbitraged away: if identical

[4] In practice, international price level comparisons adjust national baskets to account for local tastes, e.g., substituting beer in the German "basket" for wine in the French one. The International Comparisons Project has done this with considerable care and sophistication.

men's shirts cost twice in France what they do in the U.S., and if no tariffs or quotas prevent their importation into France, smart entrepreneurs should see the opportunity and ship U.S. shirts to France until prices in the two countries equalize. For this reason, theory suggests that real prices for identical goods should be the same everywhere: this is the well-known "Law of One Price" (LOP).

In practice, as a considerable literature shows, the LOP obtains only in highly attenuated form (see, *inter alia*, Kravis and Lipsey 1988; Clague 1986; Bergstrand 1991). Several factors have long been understood, empirically if not theoretically, to make for persistent differences in price levels.

Foremost among these is **wealth**, usually measured as real GDP per capita. Richer countries, independent of other plausible factors, have higher real prices, a result that is robust across virtually every possible specification. Wealth, indeed, consistently emerges as the most important single determinant of national price levels, even when one controls for the two most commonly imputed causes (Bergstrand 1991), namely (a) differences in productivity between traded and nontraded sectors (Belassa 1964; Samuelson 1964) and (b) cross-national differences in capital/labor ratios (Kravis and Lipsey 1983; Bhagwati 1984).[5]

A second factor making for persistent price-level differences might be relative **factor endowments**: not only the capital/labor ratio already mentioned, but endowments (relative to other countries) of skill (human capital) and land. In practice, human capital (proxied by education levels) turns out to be so highly correlated with endowments of physical capital to permit analysis of its separate effect on prices, if any. But abundance of arable land may imply cheaper food by permitting large-farm economies of scale and by avoiding transaction costs on food imports.

Third, there are the obvious **natural, cultural, and policy barriers** to arbitrage. Our general prior here is that economies that are less open – whether because of physical isolation, idiosyncratic or xenophobic tastes, or their governments' isolationist tendencies – will be better able to maintain prices above world levels. Our overall measure is simply imports as a share of GDP,[6] and we anticipate that – again, all else equal – greater openness entails lowers prices.

[5] Wealthier consumers may also be less price sensitive, allowing for pricing-to-market (Krugman 1987).
[6] We are well aware of the possible shortcomings of this summary measure, but (a) it is the one most readily available for our whole panel and (b) we have ascertained in cross-sectional analyses that it correlates at .9 or better with such measures of openness as deviations from a gravity model (see, e.g., Lee 1993.

Fourth, and particularly in treating time-series data, we must control for **exchange-rate fluctuation**. That domestic prices remain "sticky" even under significant changes in a country's exchange rate is a commonplace of the literature, and indeed the whole reason that currency devaluations help to remedy imbalances on the current account; but this will have obvious and significant effects on the price level as defined by PPP/XR. If the Argentine peso (to take a currently familiar example) previously traded at parity with the U.S. dollar but suddenly devalues to a peso-dollar exchange rate of 4:1, we do not expect that all Argentine prices (in peso terms) immediately quadruple (although they will certainly rise).[7] Suppose that Argentine prices only double in terms of PPP (i.e., the peso price of a given basket of goods doubles). Then the devaluation has effectively halved real Argentine prices: if previously PPP/XR equaled p, then the new price level is 2p/4, i.e. exactly half what it previously was. We therefore employ year-to-year change in the given country's exchange rate – i.e., the percentage increase or decrease from the previous year's exchange rate against the U.S. dollar – as a control variable throughout our analyses; and we anticipate that a currency *depreciation* will be associated with *lower* real prices, while an *appreciation* will lead (at least in the short run) to higher real prices.

Finally, we conjecture that **market size**, proxied here simply by the country's population, will be inversely related to price because of (a) the specialization a large domestic market permits[8] and (b) simple economies of scale.

III. The Panel Data and Our Analysis of It

We analyze, with appropriate controls as already discussed from the LOP literature, annual price data (PPP/XR) for twenty-three member states[9] of the OECD between 1970 and 2000. For years up to and including 1992, price data are taken directly from Penn World Tables, Mark 5.6; for subsequent years, the source is *OECD Main Economic Indicators*. In both sources, we have used

[7] Indeed, if domestic prices always moved in tandem with exchange-rate fluctuations, currency devaluations would bring no benefit.

[8] As Adam Smith (*Wealth of Nations*, I:3) first noted, "The Division of Labour is Limited by the Extent of the Market"; hence in many specializations price will decrease as market size increases.

[9] The set consists of all twenty-four states that were members of the OECD in 1990, except Turkey, for which data are inadequate. The countries included are thus Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, Norway, New Zealand, Portugal, Spain, Sweden, Switzerland, the UK, and the U.S. Note that the periods under dictatorship in Greece (until 1974), Portugal (until 1975), and Spain (until 1977) are excluded.

the price figures for aggregate GDP; and in both, the price level (PPP/XR) for the given country in any year is stated as a percentage of U.S. prices, e.g. a figure of 106 – as it happens, the mean over the whole period for this set of countries – signifies that overall prices are 1.06 times U.S. levels.

Our right-hand-side variables include the following:

cgdp – gross domestic product (GDP) per capita in US dollars. Source: *World Economic Outlook Database*, April 2002, http://www.imf.org/external/pubs/ft/weo/2002/01/data/index.htm.

dxr –change in national currency/US dollar exchange rate from previous year, i.e. local currency appreciation relative to the US dollar: $(XR_t - XR_{t-1}) / XR_{t-1}$. Source: IMF, International Financial Series, http://ifs.apdi.net/imf/logon.aspx.

lnlandpc – natural log of arable hectares of land per capita, i.e. ln((arable/pop)+1). Source: *World Development Indicators* CD-ROM (1999), ag.lnd.arbl.ha.pc. Arable land (hectares per person) includes land defined by the FAO as land under temporary crops (double-cropped areas are counted once), temporary meadows for mowing or for pasture, land under market or kitchen gardens, and land temporarily fallow. Land abandoned as a result of shifting cultivation is not included.

lnpop – natural log of population in million inhabitants. Source: IMF, International Financial Series (see above under dxr).

Imports – The volume of Imports of goods and services as a percent of GDP. Source: OECD, *Economic Outlook Database*.

smd – dummy for countries that employed a single member district electoral system in the given year: 1=SMD, 0=any other electoral system.

lagp – lagged dependent variable, ppp/xr for given country in previous year

Summary statistics for all variables are presented in Table 1.

Table 1

Summary Statistics for All Variables

Variable	N	Mean	Standard Deviation	Min	Max
COUNTRY	694	11.88905	6.656969	1	23
YEAR	694	1985.334	8.831634	1970	2000
P	692	105.889	24.58328	39.93	187.0588
IMPORT	694	30.43812	20.68805	5.244863	123.6583
CGDP	694	14508.39	9508.652	1505	45505.7
DXR	650	1.403602	12.36121	-29.3524	101.1253
LNLANDPC	610	-1.32839	1.227004	-3.80666	1.202148
LNPOP	694	2.446415	1.638619	-1.58475	5.639848
SMD	694	0.276657	0.447668	0	1

Preliminary data exploration suggests that the dependent variable is stationary, so we proceed with our analysis without worrying about the threat of unit root. As an obviously underspecified "first cut," we regress (Table 2, Model 1) annual price-level statistics for aggregate GDP on the electoral system dummy alone, without control variables or country fixed effects. The naïve result, using panel-corrected standard errors proposed by Beck and Katz (1995) to guard against against potential problems of panel heteroskedasticity across countries and contemporaneous correlation of error, suggests strong negative price-level effects of SMD systems.

One might reasonably suspect that the negative association between price and electoral systems found in this overly simplified model is spurious, and actually reflects an association between electoral systems and something else that affects price. Accordingly, we incorporate all of our control variables,[10] as well as country fixed effects (which an F-test of joint significance confirms as necessary). The results presented in Model 2 of Table 2 appear to be very promising. Notice immediately that the result of Wald test allows us to reject the null hypothesis that there is

[10] Note that we also include the lag of dependent variable to account for the first order autocorrelation.

no relationship between the explanatory variables and the dependent variable at less than 0.0001 level. The adjusted R^2 of more than .9 also indicates that our model provides a very good fit. More importantly, SMD electoral systems obviously continue to show statistically significant and substantively strong negative price effects; and per capita GDP, exchange-rate fluctuation, and population size emerge also as significant at the one per cent level or better with the expected sign. With these controls, a shift toward an SMD electoral system can be expected to lower prices in the typical country by about 5.5 per cent (5.8045/105.6 = .0549). Our main measure of factor endowments, arable land per capita, proves only marginally significant at 0.1 level, and our proxy for barriers to arbitrage, import share of GDP, turns out to be insignificant. Model 3 of Table 2 drops the import variable and reruns the analysis; we find that the negative price effect of the electoral system remains statistically significant and substantively important. We continue to believe, however, that arbitrage must influence real price levels and accordingly include import share of GDP, in later specifications.

Table 2

Panel Estimation Result, 23 Countries, 1970-2000

VARIABLES	MODEL 1	MODEL 2	MODEL 3
LAGP		0.7845***	.7841***
		(0.0564)	(.05640)
ES	-9.9902***	-5.8045***	-6.0673***
	(2.0286)	(1.7443)	(1.8252)
CGDP		0.0004***	0.0004***
		(0.0001)	(0.0001)
DXR		-0.0054***	-0.0054***
		(0.0004)	(0.0004)
LNLANDPC		9.866	9.8764
		(6.3108)	(6.3125)
LNPOP		-35.1993***	-34.1005***
		(10.3361)	(10.3003)
IMPORTS		0.1366	
		(0.113)	
CONSTANT	108.6609***		
	(2.8777)		
Adjusted R^2	0.0318	0.9088	0.9086
N	692	580	580
Prob > χ^2	0.0000	0.0000	0.0000

Note: Panel-corrected standard errors in parentheses. Model 2 and Model 3 are estimated with country fixed effects, but the individual country coefficients are omitted in the interest of space.
* if p<0.1, ** if p < 0.05, *** if p < 0.01.

One might object,[11] with respect to any model that includes exchange rate fluctuation as a parameter, that Belgium and Luxembourg are not independent observations, having been bound by treaty to a full currency union – and having fulfilled that obligation – since before World War

[11] We however take such objections with at least a small grain of salt. During parts of the period under consideration, other countries in our set – Austria, Denmark, France – have pegged their currencies to the German mark, and in other instances the dollar has simply appreciated (or depreciated) against all other currencies. From 1 January 1999, of course, all dozen countries of the Euro zone have been pegged to a common currency. Our real question is whether such countries' *prices* respond similarly to a currency fluctuation.

II. Table 3 therefore repeats the panel estimation, omitting Luxembourg. The results are obviously almost unchanged.[12]

Table 3

Panel Estimation Result, 22 Countries

(omitting Luxembourg), 1970-2000

VARIABLES	MODEL 4	MODEL 5	MODEL 6
LAGP		0.7757***	0.7748***
		(0.0588)	(0.0588)
SMD	-10.096***	-5.8433***	-6.2058***
	(2.0289)	(1.7974)	(1.8769)
CGDP		0.0004***	0.0005***
		(0.0002)	(0.0002)
DXR		-0.0052***	-0.0052***
		(0.0004)	(0.0004)
LNLANDPC		9.6294	9.7125
		(6.2303)	(6.2245)
LNPOP		-36.2349***	-35.308***
		(10.5415)	(10.4653)
IMPORTS		0.1532	
		(0.1232)	
CONSTANT	108.7667***		
	(2.8558)		
Adjusted R^2	0.0318	0.9088	0.9086
N	692	580	580
Prob > χ^2	0.0000	0.0000	0.0000

Note: Panel-corrected standard errors in parentheses. Model 5 and Model 6 are estimated with country fixed effects, but the individual country coefficients are omitted in the interest of space.
* if p<0.1, ** if p < 0.05, *** if p < 0.01.

An objection we take more seriously has to do with the few cases of missing data in our panel, affecting mostly arable land and exchange rate fluctuations (see again Table 1, focusing

[12] In Table 2, the electoral system estimate in Model 3 was 1.86 times its standard error; in Table 3, 1.84 times its standard error.

on the column that reports the number of observations for each variable). As King *et al.* note, when the missing data are not generated from MCAR (missing completely at random) processes, the traditional list-wise deletion approach may lead to biased parameter estimates. While we do not have any strong prior belief regarding the nature of missingness in our data, we cautiously handle the missing data problem by multiple imputation using the EMis algorithm provided by *Amelia* (Honaker et al 2001, Gauss 2.01 Version). The results are reported in Table 4.

Table 4

Panel Estimation Result, 23 Countries, 1970-2000:

With Multiple Imputation

VARIABLES	MODEL 7	MODEL 8
LAGP	0.8016***	0.8020***
	(0.0531)	(0.0532)
SMD	-4.2305***	-4.3200***
	(1.5071)	(1.5084)
CGDP	0.0004***	0.0004***
	(0.0001)	(0.0001)
DXR	-0.0053***	-0.0053***
	(0.0004)	(0.0004)
LNLANDPC	-0.2479	
	(0.8008)	
LNPOP	-46.6380***	-46.3237***
	(9.4677)	(9.5545)
IMPORTS	-0.2110*	-0.2134*
	(0.1114)	(0.1120)
Adjusted R^2	0.8996	0.9014
N	671	671
Prob > χ^2	0.0000	0.0000

Note: Panel-corrected standard errors in parentheses. Model 7 and Model 8 are estimated with country fixed effects, but the individual country coefficients are omitted in the interest of space. *if p<0.1, ** if p < 0.05, *** if p < 0.01.

From the results presented in Model 7 of Table 4, we can see that even under this more robust estimation procedure, the electoral system coefficient is significantly different from zero at less than the 0.01 level; and substantively, the results suggest that a switch from any other system to an SMD method of election could be expected to produce a price decrease in the average OECD country of about 4 per cent (4.23/105.6) in the following year. Also, note that after the multiple imputation procedure, the estimated coefficient of *IMPORTS*, which appeared insignificant in earlier specifications, now becomes significant at less than the 0.1 level and with the expected sign. Model 8 drops the insignificant *LNLANDPC* variable and reruns the analysis, and the substantive results remain unchanged.

IV. Conclusion

Logic strongly suggests that policy will be biased toward consumers under majoritarian electoral systems, toward producers – or, more generally, toward organized interests – under systems of PR; and one clear manifestation of this bias will be higher price levels under PR, lower prices under majoritarian systems. Panel evidence for the OECD countries over a period of thirty years bears out this expectation, both cross-sectionally and over time: SMD electoral systems are associated with lower prices.

At least three issues, we believe, deserve further reflection and investigation.

1) What are the precise mechanisms by which PR raises, SMD lowers, prices?
2) Why are these price effects not uniform across sectors? (It will occur to many readers that PR systems on average must have *lower* prices for education, medical care, and social services.[13])
3) Do majoritarian systems advantage consumers more than the median voter would want, do PR systems disadvantage consumers more than the median voter wants, or is the choice of electoral system largely endogenous, with pro-consumer electorates favoring SMD, pro-producer ones – particularly where organized interests are strong – inclining toward PR?

In the brief compass of this paper, we are able at best to advance conjectures about these issues. Briefly:

1) We suspect that PR systems show a far greater tolerance for cartels, covert protection, and inefficient retailing. Hall, Iversen, Soskice, and others have argued cogently that these anti-competitive mechanisms are so intermeshed with educational, labor-market, and political institutions as to be almost impervious to change.
2) Why education and medical care are virtually free goods in a country like Sweden or Germany, while almost all other prices considerably exceed world levels, is a difficult and challenging question, which we would like a large grant to study.
3) While over time both electoral systems may provide equally faithful representation of the median voter, clearly the results reported here suggest that periods of change imply deviation from median-voter preferences. If prices *before* adoption of SMD reflected what the median voter wanted, the lower prices *after* adoption cannot

equally represent the median voter's preferences. Given the stickiness of electoral systems, we conjecture that electoral systems change when the existing method has consistently failed to represent the median voter; and that the post-change method, even if it also fails, will be chosen to bring policy closer to what the median voter wants. The changes in Italy and New Zealand, and the debate surrounding them, were particularly instructive but cannot be addressed here.

[13] Although it had not occurred to us until Ruth Collier raised it in a seminar at UC Berkeley.

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APPENDIX
Why Seats-Votes Elasticities Affect the Producer-Consumer Balance of Policy[14]

Suppose that the incumbent government, and the opposition, care about two things: (a) *legislative*, or parliamentary, support and (b) campaign funds, or more generally *money*. Let L denote the former, M the latter; then, consistent with Stigler-Peltzman, we stylize political support S as a Cobb-Douglas function of the form

$$S = M^{\alpha} L^{1-\alpha} \,|\, \alpha \in (0,1) \qquad (1).$$

Legislative support—the share of seats in parliament that the government can command—is taken as a function of vote share V, i.e., L = L(V), dL/dV > 0. For simplicity we regard producers and consumers as mutually exclusive groups and assume—realistically, we believe—that consumers can contribute only votes, while producers can offer both votes and money.[15] We take it that consumers' support (in votes) will be decreasing in p (the price level), while producers' support (in both money and votes) will be increasing in π, the level of profits.

Slightly more formally, we have

$$M = M(\pi),\ dM/d\pi > 0 \qquad (2)$$

and

$$V = V_p(\pi) + V_c(p),\ dV_p/d\pi > 0,\ dV_c/dp < 0 \qquad (3),$$

where V_p denotes vote share from producers, V_c vote share from consumers.

With appropriate substitution from (2), (3), and the formula for L, we can rewrite (1) wholly in terms of π and p as

$$S = (M(\pi))^{\alpha}\left[L(V_p(\pi)+V_c(p))\right]^{1-\alpha} \qquad (4);$$

and from here we can determine the MRS, dπ/dp, according to the conventional formula (or via the Implicit Function Theorem)

$$\frac{d\pi}{dp} = -\frac{\partial S/\partial p}{\partial S/\partial \pi} \qquad (5).$$

Note first that $\partial S/\partial p = (M(\pi))^{\alpha}(1-\alpha)L^{-\alpha}(dL/dV)(dV_c/dp)$ (6),[16]

[14] This simply replicates the core argument of Rogowski and Kayser 2002.

[15] Note that this assumption "stacks the deck" against our claim that electoral system matters for the shape of isosupport curves. If, by analogy to Denzau and Munger (1986,especially 93), we assumed that consumers could contribute only votes, producers only money, the greater steepness of majoritarian isosupport curves would follow almost self-evidently.

[16] Note that, by (3), $\partial V/\partial V_c = \partial V/\partial V_p = 1$; hence we can ignore both terms in applying the chain rule of differentiation.

while $\partial S/\partial \pi =$ $\alpha(M(\pi))^{\alpha-1}(dM/d\pi)L^{1-\alpha} + (1-\alpha)(M(\pi))^{\alpha}L^{-\alpha}(dL/dV)(dV_p/d\pi)$ (7).

The MRS can then be stated as $d\pi/dp =$ $$-\frac{dV_c/dp}{\frac{\alpha}{1-\alpha}\frac{\frac{dM/d\pi}{M(\pi)}}{\frac{dL/dV}{L(V)}} + \frac{dV_p}{d\pi}}$$ (8).

Since by assumption $dV_c/dp < 0$, while all other terms in (8) are positive, the MRS is *positive* (thus producing the upward-sloping Stigler-Peltzman isosupport curves).

The comparative statics revealed by (8) accord for the most part with intuition. The isosupport curves become *steeper* (signifying greater consumer power and, all else equal, lower prices) as:[17]

- consumer votes become more responsive to prices (dV_c/dp grows more negative);
- politicians weight votes (as opposed to money) more heavily (decreasing α, hence increasing $1-\alpha$); or
- politicians already have more monetary support (higher M).

Conversely, the curves become *flatter* (implying greater producer power and higher prices) when:

- producers' votes or monetary contributions become more responsive to profits (rising $dM/d\pi$ or $dV_p/d\pi$)
- politicians weight money more heavily (larger α) or
- the government already enjoys higher levels of parliamentary support (L).[18]

Our most important result is not at all intuitively obvious but clear from (8): the isosupport curves become *steeper*, therefore more consumer-friendly, as

- seats-votes elasticity (dL/dV) increases.[19]

That is, the greater the percentage increase in seats produced by a one percent increase in votes, the more policy will favor consumers and—assuming that the original Stigler-Peltzman analysis is correct—the more closely prices will approximate the competitive level. Given that, in any reasonably competitive circumstances, the seats-votes elasticity is higher in majoritarian electoral systems, consumers will be more advantaged the more majoritarian the method of election.

[17] Whatever decreases the denominator in (8) increases the MRS, i.e., implies steeper curves; whatever increases the denominator decreases the MRS, implying flatter isosupport curves.
[18] Thus, all else equal, countries with entrenched dominant parties—Japan under the LDP, Mexico under the PRI, India under the Congress Party—will disadvantage consumers.
[19] As dL/dV increases, holding all other terms constant, the overall denominator in (8) *decreases*; hence the MRS *increases*, implying a steeper isosupport curve.