Measuring the Economic Effects of Cartels in Developing Countries

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1. The context of the research

The detection and sanction of cartels are of a high importance for anti-trust authorities in developed countries. Cartels might be harmful to consumers and input purchasers welfare. Firstly, they could overcharge for their products or services since competition is by definition reduced. They may also block the entry of new rivals.

In case of developing countries there exist some additional issues. For example, the harm caused by cartels is expected to be even higher as rise in prices can drastically affect the real income of poorest people. Concerns are even more serious given that cartel anti-competitive practices can be sustainable for a longer period of time, which is the case for developing economies as their economic environment might provide favorable conditions to cartel sustainability (for instance, imperfect capital markets, state regulation or technology can make the barriers of entry higher in local industries). All these issues are discussed and supported by a substantial number of cases in a paper of Jenny (2006).

The effects of cartelization could be even stronger if we consider the international scope. The number of international cartels is increasing over time and this could be more harmful to developing countries as in addition to higher prices, they may result in a transfer of wealth abroad and/or the increase of strategic barriers blocking exports from developing countries. Based on the international trade flows data and a list of nineteen detected international cartels Suslow and Levenshtein (2004) had an attempt to estimate the potential effect of international cartels for developing countries. It was shown that the share of economy affected by cartel might be substantial (up to 6% in terms of total imports and 1% in terms of GDP). The estimation of the annual overcharge for those imports by developing countries to be amount to between 1/3 and 1/2 of the annual aid to economic development provided by developed countries. Given that significant part of the data the authors had could not be processed due to different methodological problems, obtained results suggest that the price effects can be even higher.

Nonetheless, some question whether competition law enforcement in fact positively impacts economic growth in developing countries.

Several issues should be taken into account. First, functioning and implementation of competition policy requires substantial investments, thus it is important to know to which extent it is efficient in a sense of preventing the society from potential welfare losses. Especially this is relevant for developing countries experiencing tougher budget constraints.

The enforcement of domestic competition might contribute to the decrease of profit rates in developing countries, thereby deterring investment and, in particular, foreign direct investment which is badly needed in countries which have an insufficient capital base. In addition, cartel may serve as a framework for the technology transfer, which in turn could have a positive effect either on costs or on product characteristics.

Important constraint for competition can naturally rise from the industry specifics and market imperfections such as scale economies, financial constraints etc., which call for market interventions. But we do not focus on these issues in current research.

Given the complexity of the possible effects of cartelization, this topic calls for further investigation. To date in practice, even in the most established area of competition policy, cartel deterrence, there is no strong empirical evidence on the actual effects of the anticompetitive practices (e.g. competitors communicating on prices) on social welfare and economic growth.

In some papers it was found that competition and competition policy contribute to the social welfare (see Baker (2003), Werden (2003), Nicoletti and Scarpetta (2003), Griffith and Harrison (2004), Aghion et al.(2009)), especially in those countries where it is coupled with efficient and effective institutions in general, and judicial system, in particular (P. Buccirossi, L. Ciari et al. (2009), Aghion and Howitt (2006)).

However, these results are not robust. For example, Crandall and Winston (2003) in their work also tried to assess if antitrust enforcement improves social welfare, and they concluded that the empirical evidence is weak. They also highlighted that the literature they used “has not been able to utilize all potentially

fruitful sources of data and has rarely implemented recent empirical advances in industrial organization to analyze the effects of specific antitrust cases".

There are no convincing results also in studies of price overcharges. For example, Newmark (1988) found that an antitrust indictment of bakers in Seattle had no effect on the price of bread. Sproul (1993) analyzed a sample of 25 price fixing cases between 1973 and 1984 and found that, controlling for other influences, prices rose an average of 7 percent four years after an indictment. Prices fell only by 10 percent even in the most successful cases.

One possible explanation for non-decreasing price after the cartel is uncovered might be the fact that colluding firms had other goals rather than raising prices (e.g. distributional goals, etc.). Sproul (1993), again, suggests that a cartel may reduce costs through shared advertising and research, which may tend to reduce prices rather than to increase them. It could be especially the case for international cartels, when a firm from developing country can benefit from the research costs sharing or technology transfer, which can result in a costs decrease and/or an improvement of product characteristics.

Bolotova, Connor and Miller (2008) in their paper studied two cartels based on the time series data on prices. They focused on two statistical moments (average and variance) of the price, trying to verify the hypothesis if collusion leads to higher average price and less price volatility. As a result, they indeed obtained a higher average price levels, but the variance was not significantly different for the periods of collusion and competition. Moreover, price variance during cartelization was even higher.

The presented above papers show the lack of strong empirical evidence based on the time series and cross - section analysis. In couple with the weak statistical significance of parameters of meta-analysis (Bolotova&Connor, 2006) it all favors the case-by-case estimation methodology.

Also, to date, research on this question for developing countries has mainly taken a qualitative approach without measuring the actual harm caused by cartels in developing countries. The present research project aims to bridge this gap by carrying out a quantitative assessment of economic effects of cartels in developing countries.

It will also provide the required economic data allowing for a quantitative assessment of the potential for competition law enforcement to contribute to economic development. Competition authorities in developing countries will have a practical interest in the respective results for their advocacy efforts. Furthermore, competition authorities in developing countries may wish to take advantage of the proposed methodology for their own cartel investigations as it will reduce the data required to estimate the effects of cartelization, for example, to measure price overcharges.

2. Measuring the Economic Effects of Cartels in Developing Countries

The research will be carried out in three phases:

Phase 1. Data collection.

Phase 2. Calibration of the market parameter and simulation of the competitive state.

Phase 3. Estimation of the impact of cartels on economic growth.

Phase 1. Data collection.

During the first phase a database on hardcore cartels in selected developing countries shall be created. For this purpose, competition authorities are asked to fill out a questionnaire (see Attachment A) on the basic micro and macro data necessary for simulations.

List of countries chosen to participate in the research is formed according to the active state of their competition authorities and the sufficiency of the experience they possess. To date, there are several countries, which agreed and actually provide data on cartels (Brazil, Turkey, Pakistan, South Africa, El Salvador). See Attachment B for the whole list of countries, chosen to take part in the research.

Phase 2. Calibration and simulation.

As was mentioned before, here we employ a case-by-case approach to estimate each cartel' economic damages.

Based on the data received on the Phase 1, we first calibrate the parameters of the cartelized market. It will be described further what kind of data is necessary for calibration and which particular market parameters need to be estimated. Having the estimated market parameters in hands, we then proceed to the simulation of the hypothetical (counterfactual) market conditions without cartelizing conduct and compare them to the existing conditions, which are characterized by the presence of cartels. This will allow the calculation of price overcharges, losses in consumer welfare and possibly outputting effect.

To perform calibration of the market parameters, we consider a model, which describes the equilibrium outcomes on the differentiated product market, where firms compete in prices (differentiating product characteristics are assumed to be fixed).

Precisely, we consider the "supply-and-demand" framework on the oligopoly market with differentiated products, developing on the approach offered by Berry (1994). Demand and supply are modeled separately in order to recover equilibrium outcomes.

Market demand is derived from a general class of discrete choice models of consumer behavior. There are N potential consumers on the market, who are considering to buy a product from one of J firms (who form a cartel) or otherwise choose the outside good 0. Outside good 0 may represent a substitute offered by other firms (not participating in the cartel) on the market as well as the decision not to buy at all. All products are considered to be within the same market (e.g. being close substitutes), but differentiated in some quality features and prices by firms.

Discrete choice models are good to obtain the desirable structure of demand, but at the same time they rule out the purchase of multiple items and do not easily incorporate dynamic aspects of demand.

The utility of consumer *i* buying product *j* is defined as $u_{ij} = V_j + \vartheta_{ij}$, where V_j if the mean valuation for product *j*, common for all consumers, and ϑ_{ij} -consumer *i*'s utility specific to product *j* are assumed identically and independently distributed across consumers and choices. V_j can be further decomposed: $V_j = \delta_j - \alpha p_j$, where α can be interpreted as the sensitivity of utility to the price and δ_j is the parameter of differentiation.

Each consumer *i* chooses product *j*, which maximizes her expected utility:

$$U_{ij} > U_{ij'} \quad \forall j' \neq j$$

On the aggregated level the probabilities of consumers' choice are approximated with the market shares of corresponding good s_j.

Then $s_j = q_j / N$, where q_j is the quantity of the good j on the market and *N* is the size of the market .

Following methodology, developed by Berry (1994), demand associated with alternative j is described by the equation:

$$\ln(s_j) - \ln(s_0) = \delta_j - \alpha p_j \quad (1)$$

$$\text{and } s_j = \frac{\exp(\delta_j - \alpha p_j)}{1 + \sum_{i=1}^{N} \exp(\delta_i - \alpha p_i)}, \quad \forall j = \overline{1,J} \quad (2)$$

where s_0 is the share of the outside alternative, such that $\sum_{j=1}^{J} s_j + s_0 = 1$

Then own price demand elasticity is expressed by formula:

$$\varepsilon_j = \alpha p_i (1 - s_i) \quad \forall j = \overline{1,J} \quad (3)$$

And the aggregate demand elasticity is:

$$\varepsilon_d = -\alpha p^{cartel}{}_i s_0 \quad \forall j = \overline{1,J} \quad , \quad (4)$$

where $p^{cartel\ average} = \sum_{i=1}^{J} s_i * p_i^{cartel}$

In such a differentiated-products framework and oligopoly structure, firms are competing both in terms of prices and product characteristics.
Profit of each firm *j* on the market is defined by the function:

$$\pi_j = (p_j - c_j) q_j - K_j, j = \overline{1,J} \quad (5)$$

where c_j are marginal costs and K_j are fixed costs, specific for each firm.

As it was mentioned before, we consider a market where J firms form a cartel. Here and after we employ the hypothesis that forming cartel firms agree to fix either brute margins $BM = (p_j^{cartel} - c_j) = const\ \forall j, j = \overline{1,J}$ or average margin $AM = \sum_{j=1}^{J} s_i^{cartel} (p^{cartel}{}_j - c_j)$ to some value.

From the cartel profit maximization problem and demand equation (1), under the hypothesis above, we obtain the following equality:

$$(p_j^{cartel} - c_j) = 1/\alpha s_0, j = \overline{1,J}, \quad (6)$$

Thus, equations (1), (4) and (6) fully describe the equilibrium on the differentiated product market, where J firms form a cartel. Given that prices $p_j^{cartel}, j = \overline{1,J}$ and market shares $s_j^{cartel}, j = \overline{1,J}$ we can recover from factual data, then to solve this system of equations we need to set two parameters exogenously.

Common sense and the availability of the industry data for majority of cases allow us to set (the interval for) the share of external alternative s_0 and a cartel margin (BM or AM). Only BM is reflected in the equation (6) directly, but it is easily transformable into AM and back. We choose AM instead of BM, as it is intuitively easier to set.

In addition, there are two constraints, which our parameters should allow to hold.

Constraint 1. To obtain positive marginal costs, we need $|\varepsilon_m| > p^{cartel\ average} / Min\{p_i^{cartel}\}, \quad \forall i = \overline{1,J} \quad where\ p^{cartel\ average} = \sum_{i=1}^{J} s_i * p_i^{cartel}$

Constraint 2. For the share of the outside alternative s_0 to be less than 1 we need $\alpha > |\varepsilon_m| / p_m$

We then solve the system of equations (1), (4) and (6) for the chosen range of two exogenously fixed parameters (s_0 and AM). As a solution we have calibrated:

- Demand parameters:
  - α - reflects sensitivity to price, common for all products;
  - $\delta_j, j = \overline{1,J}$ - parameters of differentiation, specific to each product, the higher delta the more consumers value the product;
  - ε_d - elasticity of the aggregate demand
- Supply parameters:
  - $c_j, j = \overline{1,J}$ - marginal costs, specific to each firm.

Now, having the estimated market parameters in hands, we proceed to the simulation of the hypothetical (counterfactual) competitive market equilibrium.

In the competitive state (in the absence of collusion) equilibrium outcomes are defined within a Bertrand - Nash competition: firms compete in prices, knowing that competitors do the same: each firm takes a decision on price to maximize own profits, given the own marginal costs and prices, set by the other firms. Thus, we have a standard solution for each firm profit maximization problem:

$$\frac{p_j - c_j}{p_j} = -\frac{1}{\varepsilon_j}, \forall j = \overline{1,J} \qquad (7)$$

Differentiating characteristics are exogenously set in this model. An increase in one firm's price has a positive impact on it's margin but negative impact on demanded volume.

Using (7) and the demand equations (1), (2) and (3), we finally obtain equality, which fully defines the competitive equilibrium:

$$\frac{p_j - c_j}{p_j} = \frac{1}{\alpha p_j (1 - s_j)}, \forall j = \overline{1,J} \qquad (8)$$

$$\text{where } s_j = \frac{\exp(\delta_j - \alpha p_j)}{1 + \sum_{i=1}^{N} \exp(\delta_i - \alpha p_i)}, \quad \forall j = \overline{1,J}$$

As a solution of (8) we obtain counterfactual competitive prices $p_j^c, j = \overline{1,J}$ and market shares $s_j^c, j = \overline{1,J}$, which would have place on the market absent collusion.

Now we are ready to calculate price overcharges:

$$\Delta P\% = \sum_{j=1}^{J} s_j^{cartel} \frac{p_j^{cartel} - p_j^c}{p_j^{cartel}}, \quad \forall j = \overline{1,J} \qquad (9)$$

Apart of price overcharges, we can also consider change in consumers' surplus as another instrument to estimate the harm caused by cartelization. Net consumers' surplus can be estimated using following formula (see Anderson et al., 1992)

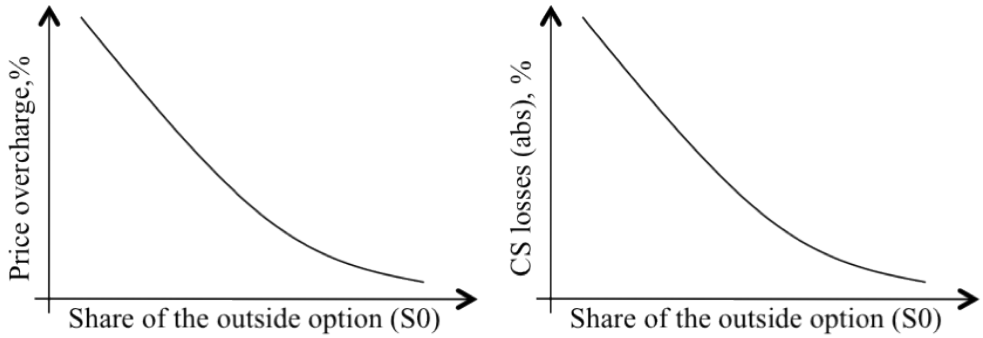
$$CS = \frac{1}{\alpha}\ln(1 + \sum_{j=1}^{J}(\delta_j - \alpha p_j)) \quad (10)$$

Then, consumers' welfare losses are defined by

$$\Delta CS\% = \frac{\ln(1 + \sum_{j=1}^{J}(\delta_j - \alpha p_j^c) - \ln(1 + \sum_{j=1}^{J}(\delta_j - \alpha p_j^{cartel})}{\ln(1 + \sum_{j=1}^{J}(\delta_j - \alpha p_j^c)} \quad (11)$$

As it was mentioned before, we set exogenous parameters as a range, then the output of this stage (price overcharges and consumers' welfare losses) we obtain also as a range. The sensitivity of the results to the parameters values we can estimate looking at the following graphs (here illustrative).

Picture 1. Impact of changes in the exogenous parameters on the estimation results



These dependencies follow our intuition. The higher the share of the outside option s_0 the less market power the cartel can have, then it's ability to raise prices is

more limited. This explains the negative relationship between s_0 and price overcharge. At the same time, the less price overcharge, the less harmful is the cartel for consumers; hence welfare losses also decrease with s_0.

Similar for the other graph: higher average cartel margin leads to higher price overcharges. However the consumers' welfare losses may remain constant. This happens due to the fact, that if share of alternative option remains constant, then sum of market shares of the firms is also constant; if shares do not change much between competitive and collusive state, then given demand equation (1) values $\delta_j - \alpha p_j$, which contribute to the formula of consumers' welfare, are constant for all values of average margin.

To see how this methodology works in practice, we present further in the paper a particular case of a cartel among civil airlines in Brazil.

Phase 3. Estimation of the impact of cartels on economic growth.

General idea of phase 3 is to extrapolate results obtained in phase 2 onto the macro-economic level in order to obtain aggregated measure of the cartels' impact on economy.

Having estimated price overcharges and consumers' welfare losses for each of major hard-core cartels in the country for a certain period, we then use an input-output matrix of the country to see how the estimated effect spread through the economy. After extrapolation on the macro level and summation, we obtain the minimum level of economic damages due to cartelization.

We say minimal because of three reasons. First one is the hidden nature of cartels. Current research is based on the cases already disclosed and does not take into account neither cases when it was not possible to prove the existence of collusion (even if it took place) nor, obviously, hidden collusion. Second, data on some cartels even convicted is considered to be confidential, thus we are not able to perform estimations. Finally, for some cases proposed methodology is not possible to apply. This is the case, for example, when we deal with by-products or products in a bundle (for example SMS and calls) when consumers' choice is too complex.

Illustration. Cartel among the civil airlines, Brazil.

Here we consider a case of collusion between civil airlines in Brazil, which took place in 1999. We will skip describing all the evidence that the Competition Authority collected to convict a cartel and will focus on the estimation of the harm, caused by this anticompetitive practice.

Four airlines (namely Varig, TAM, Transbrasil and VASP) were convicted in collusive behavior, which they practiced in the year of 1999. Considered relevant market, where they were able to fix prices on a higher level, was the civil air transportation between Rio de Janeiro (airport Santos Dumont) and San Paolo (airport Congonhas), where presented firms counted for 100% of flights.

The table below presents a basic/minimal fact data, which is necessary to perform calibration of the demand and supply parameters.

Table 1. Input data (July 1999)

Airline	Market share, % of sales	Price of a one way ticket, R$
VARIG	46.6%	129.32
TAM	41.5%	124.90
Transbrasil	6.5%	106.85
VASP	5.4%	108.03

Source: Conselho Administrativo de Defesa Econômica, Brazil

Basic data set is available only for July 1999. Here it makes the advantage of the proposed methodology more clear - we need data only for one period of cartel existence.

It would be more correct to separate leisure and business segments, which would obviously have different sensitivity to price α. But unfortunately available data does not permit us to do so. Given that the share of business trips is around 70% we believe that recovered further parameters will reflect mostly the behavior of this segment.

As it was mentioned in the theoretical part above, to perform calibration of the model we need to set two parameters, namely share of the outside alternative (s_0) and average cartel margin (AM) exogenously.

Knowledge of some industry characteristics, such as flight duration (1 hour) and a business/leisure trips rate (70%/30%), helps us to set a range for the share of the outside alternative: it should not be too high given that for business trips there are no very good alternatives as train and bus communication between Rio de Janeiro and San Paolo is weak.

As for the second exogenous parameter – average cartel margin (AM), we use the results of Betancor and Nombela (2001) showing us that, in average, marginal costs are at least equal to the average costs (for the American airlines) or twice higher than that (for European airlines). Given extracted average costs from the annual reports of the firms, we get 35% as a maximal value for the average margin (when marginal costs are equal to average). After a final check with the Constraint 1 and 2, we define a range for external parameters, which in turn defines a range for the resulting estimations:

$s_0 = [5\%, 50\%]$

$AM = [5\%, 35\%]$

See Table 2 for the example of the parameters estimations and resulting price overcharges and welfare losses when cartel average margin is set to 25% and share of the outside market to 30%.

Table 2. Results of the model calibration and simulation of the competitive state

Airline	**DELTA***	**MC (R$)***	**Price overcharge**	**Output loss**
VARIG	9.78	84.86	18.7%	5.2%
TAM	9.33	80.45	20.7%	7.4%
Transbrasil	6.12	62.39	36.8%	5.3%
VASP	6.03	63.57	36.7%	4.6%
Alpha = 0.07			Avrg 21.7%	Sum 22.5%

Source: Simulations

Estimations support our intuition that those airlines with higher market shares should either have lower price level or higher appreciation by consumers (δ). In addition, in accordance with the other theoretical research on cartels, results confirm the fact that weak participants profit the most of collusion: estimated price overcharges for VASP and Transbrasil airlines with the lowest market shares are the highest.

Unfortunately, there are no any estimations of demand elasticity for the considered relevant market, thus we can only check whether estimated marginal costs are meaningful. For this, we use again the results of Betancor and Nombela (2001) to define an interval where the estimations could be considered as reasonable:

$$ATC_i \le c_i \le \max[2 * ATC_i; p_i], \qquad (12)$$

where ATC_i are average total costs of firm j.

This constraint helps us to narrow down the range for external parameters (see Table 3): average cartel margin cannot exceed 25% as it implies too low marginal costs.

Table 3. Estimation of the airlines' marginal costs

Estimation of the average price overcharge		**Average cartel margin**			
		5%	**15%**	**25%**	**35%**
Share of the outside alternative (S0)	**5%**	√	X	X	X
	15%	√	√	X	X
	30%	√	√	X	X
	50%	√	√	X	X

Source: Simulations

See Table 4 and Table 5 for estimation of average price overcharges and consumers welfare losses caused by cartel among civil airlines for a new limited range of external parameters.

Table 4. Estimation of the price overcharge caused by cartel

Estimation of the average price overcharge		Average cartel margin (AM)	
		5%	15%
Share of the outside alternative (S0)	5%	5.1%	X
	15%	4.7%	15.7%
	30%	4.1%	12.7%
	50%	3.8%	9.4%

Source: Simulations

Table 5. Estimation of the consumers' welfare losses caused by cartel.

Loss in consumers' welfare		Average cartel margin (AM)	
		5%	15%
Share of the outside alternative (S0)	5%	86.1%	X
	15%	72.3%	72.3%
	30%	56.3%	55.1%
	50%	38.1%	31.9%

Source: Simulations

Having such estimations for each hard - core cartel for a certain period in a country we then proceed to phase 3 of the research as described above.

List of literature

Baker, J. B (2003). “The Case for Antitrust Enforcement”. Journal of Economic Perspectives, Vol. 17, Number 4, Fall 2003, Pages 27-50

Basso, L., Ross, T.W. (2008.) “Measuring the true harm from price-fixing to both direct and indirect purchasers”. Working paper.

Berry, S.T. (1994). "Estimating Discrete-Choice Models of Product Differentiation, RAND Journal of Economics, vol. 25(2), pages 242-262

Besanko, D. et al. (1998) “Logit Demand Estimation under Competitive Pricing Behavior: An Equilibrium Framework”, Management Science, Vol. 44, No. 11, Part 1 of 2 (Nov., 1998), pp. 1533-1547

Bolotova, Y., J.M. Connor and D.J.Miller. 2008. “The impact of collusion on price behavior: Empirical results from two recent cases”, International Journal of Industrial Organization, 26, 1290-1307.

Boone, J., Müller, W. (2008) “The distribution of harm in price-fixing cases”, CenER Discussion paper.

Buccirossi, P. al. (2009) “Competition policy and productivity growth: An empirical assessment” CIG Working Papers with number SP II 2009-12.

“Competition, competitiveness and development: lessons from developing countries” (2004), UNCTAD report

Connor, J.M. and Y. Bolotova. 2006. “Cartel overcharges: Survey and meta-analysis”, International Journal of Industrial Organization, 24, 1009-1137.

Crandall, R.W., Winston, C. (2004) “Does Antitrust Policy Improve Consumer Welfare? Assessing the Evidence”, The Journal of Economic Perspectives, Vol. 17, No. 4 (Autumn, 2003), pp. 3-26

Dutz, M.A., Vagliasindi M. (2000) “Competition policy implementation in transition economies: An empirical assessment”, European Economic Review 44 (2000) 762-772

Evenett, S.J., Levenstein, M.C., Suslow, (2001)V.Y. “International Cartel Enforcement. Lessons from the 1990s”, Policy research working paper of the World Bank

Griffith, R., Harisson, R. (2004) "The link between product market reform and macro-economic performance," European Economy - Economic Papers 209, Directorate General Economic and Monetary Affairs, European Commission

Hoekman, B., Holmes, P. (1999) “Competition Policy, Developing Countries, and the World Trade Organization”, Policy research working paper of the World Bank

Hyytinen, A., Steen, F., Toivanen, O. (2010) “Cartels uncovered”, working paper.

Ivaldi, M, Verboven, F. (2005) “Quantifying the effects from horizontal mergers in European competition policy”, International Journal of Industrial Organization 23 (2005) 669–691

Ivaldi, M., Vibes, C. (2007), “Price competition in the intercity passenger transport market: a simulation model”,Journal of Transport Economics and Policy, vol. 42, n°2, May 2008

Jenny, F. (2006) “Cartels and Collusion in Developing Countries: Lessons from Empirical Evidence”, World Competition 29(1): 109-137, 2006.

Levenstein, M.C., Valerie Y. Suslow, V.Y. ,J. Oswald, L. J. (2003) “Contemporary International Cartels And Developing Countries: Economic Effects And Implications For Competition Policy”, Working Paper #03-10

Pakes, A., Berry, S., Levinsohn, J. (1993). "Applications and Limitations of Some Recent Advances in Empirical Industrial Organization: Price Indexes and the Analysis of Environmental Change," American Economic Review, vol. 83(2), pages 241-46, May.

Sproul, M. F., (1993). "Antitrust and Prices," Journal of Political Economy, vol. 101(4), pages 741-54

“Study on the conditions of claims for damages in case of infringement of EC competition rules. Analysis of economic models for the calculation of damages.” (2004) Report by “Ashurst”

Verboven, F., Van Dijk, T. (2009) Cartel damage claims and the passing-on defense”, Center for Economic Studies, discussion paper # ces0715.

Attachment A. Questionnaire

FIRST PART. General questions

1) Is there any active leniency program in place? Since when?
2) Budget of the Competition policy unit during the considered period (1995-2005)

SECOND PART. Provide data on cartel members.

3) Identification of major ("hard core") cartels for the period 1995-2005 in three different cases:
   a. Basic final products that affect consumers;
   b. Intermediary products and transportation and distribution services;
   c. Government procurement of public goods (e.g. construction of school or hospital).
4) For each identified cartel, provide information on:
   a. Name of cartel members and nationality (national producer, foreign subsidiary or foreign exporter);
   b. Period of existence of the cartel (beginning/termination);
   c. Date of discovery of the cartel;
   d. Date of entry of each company in the cartel coalition;
   e. Fines applied (if any).

THIRD PART. Provide data on the production level and the product price for each cartel and non-cartel members in markets, identified in the first section of the questionnaire.

5) Identification (name and nationality) of all companies (national producer, foreign subsidiary or foreign exporter) selling the studied product.
6) For the period of cartel existence, for one period (month/year) before and one period after, indicate
   a. The monthly volume and price of the product for each company;
   b. Whether goods are locally produced or imported goods;
7) Identify all possible substitute products and tell for each of them the volume of industrial production.
8) Please, provide the estimate of the volume of the relevant market (if at hand at Competition Authority); if not:

9) According to the good that is analyzed, please indicate:

   c. For a basic final product: the annual number of households in the country and the average income per household;

   d. For intermediate inputs - or transportation and distribution services: the number of companies using the input - or services - and their annual turnovers;

   e. For public goods: the annual state budget and the annual spending of the minister or public department in charge of the procurement of the public good.

Attachment B. List of countries

Argentina
Barbados
Belarus
Benin
Brazil
Burkina Faso
Cameroon
Chile
China
Colombia
Costa Rica
Egypt
El Salvador
Fiji
Gabon
Indonesia
Jamaica
Kazakhstan
Malawi
Mali
Mexico
Moldova
Morocco
Namibia
Pakistan
Peru
Russia
Senegal
South Africa
Suriname
Tanzania
Thailand
Tunisia
Turkey
Ukraine
Uzbekistan
Venezuela
Zambia
Zimbabwe