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Global Coffee Import Demand in a New Era: Implications for Developing Countries

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With coffee prices at their lowest in a century, producing countries, which are mostly developing countries, are facing the worst crisis in history. The International Coffee Organization (ICO) acknowledges that poverty and unemployment are growing so rapidly that the consequences would be dire if nothing is done to halt the decline. This study draws welfare implications for producing countries based on import demand analysis for coffee in the three largest importers - the United States, European Union, and Japan. A differential production approach is employed. Results imply that coffee-producing countries will continue to be worse off with the expansion of exports. Hence, we suggest that they attempt new marketing strategies that include consistent provision of higher quality coffees, differentiation with value-adding activities, and campaigns to boost domestic consumption. Producer organizations must be strengthened to provide essential services to farmers. Diversification and increased access to industrialized markets could also help to mitigate the crisis.

Key words*:* *Coffee, import, marketing strategies*

JEL Classifications: *F10; F11; Q10.*

INTRODUCTION

Over 90 per cent of the world's coffee production takes place in developing nations. The top ten producers are a group of middle- and low-income developing countries, which in 1990 accounted for 63 per cent of total production. In 2003, they accounted for roughly 77 per cent of total production (Figure 1). Coffee is a major foreign exchange earner and accounts for at least 10 per cent of total export earnings in several countries. In some low-income countries, it comprises an even larger proportion of total export earnings. In Burundi and Rwanda for example, the share of the export value represented by coffee exceeds 50 per cent (Lewin et al. 2004). Brazil, Vietnam and Colombia are the largest producers; in 2002 they provided 60 per cent of world supply and 55 per cent of global exports (Lewin et al. 2004). Hard arabica and robusta are the principal types grown in Brazil, whereas Vietnam and Colombia produce robusta

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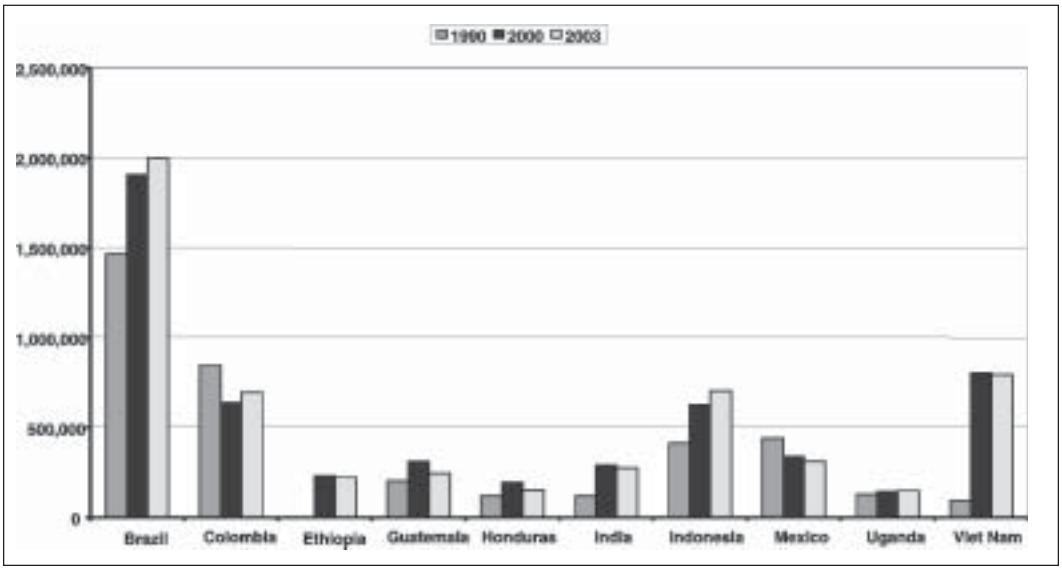
Figure 1
The Top Ten Producers of Green Coffee: Metric Tons of Green Coffee



Source: FAO (2005).

and mild arabica, respectively. Almost all coffee exported globally is green coffee, and the United States, European Union, and Japan are the largest importers of green coffee. Currently, producing countries comprise only 25 per cent of global demand. This therefore implies that the bulk of coffee consumption takes place in industrialized countries.

The global coffee industry was relatively stable between 1962 and 1989, since it was essentially managed according to conditions set forth by the International Coffee Agreement (ICA). Since the ICA's collapse in 1989 however, the industry has evolved in a manner that can be characterized as paradoxical. In importing countries, markets are expanding, differentiated products are being developed, and profits are increasing. Conversely, coffee industries in producing countries are in shambles, prices are the lowest in years, and farmers are losing much needed income. The economic, social and environmental impacts are of such significance that the International Coffee Organization (ICO) has acknowledged that the global coffee industry is facing its worst crisis in history, trapped in a vicious cycle of excess supply, sluggish demand, and collapsing prices, that has increased poverty and unemployment in many producing countries. In its Annual Review for 2002/03, the ICO warned that the consequences would likely be dire for many producing countries if nothing were done to halt the decline (ICO, 2003).

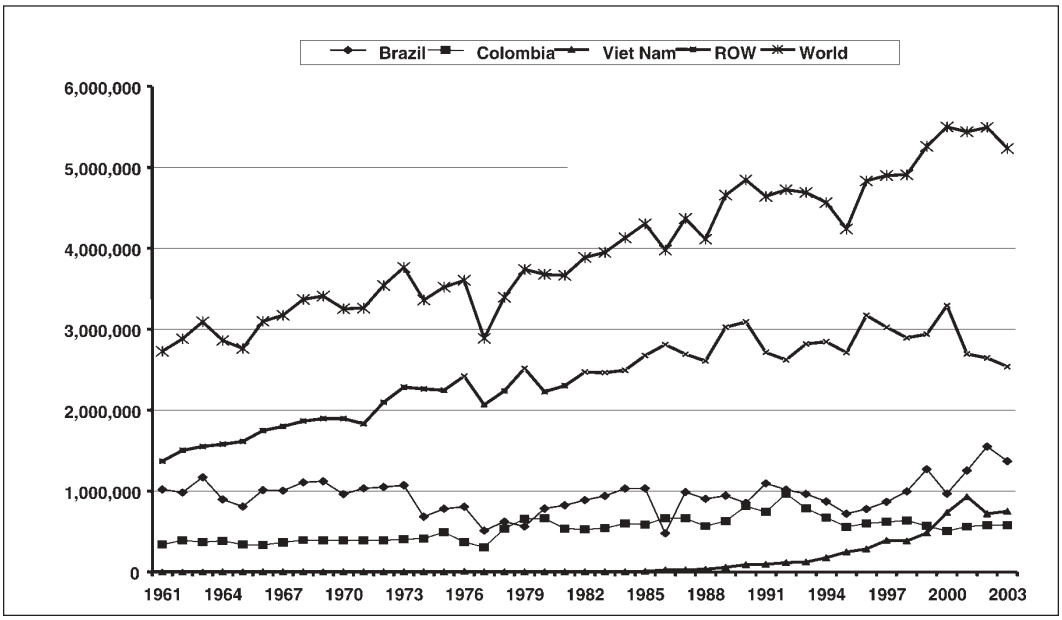
In this paper, we aim to assess the welfare implications for producing countries based on the demand for coffee in the three largest importing countries, namely, the United States, European Union, and Japan. A differential production approach is employed, and conditional own price and Divisia volume index elasticities are estimated. Based on our findings, we discuss the policy implications, as well as the various options that can help to lessen the brunt of the crisis in developing countries.

New Developments in Supply and Demand

The global coffee industry has undergone profound change in the last several years. On the supply side, Vietnam's entry into the market contributed to an overall increase in worldwide coffee stocks. As shown in Figure 2, exports from Vietnam were practically nonexistent prior to the 1980s. However, by 2000, Vietnam had managed such remarkable growth that it had effectively displaced Colombia as the second largest coffee supplier after Brazil. Vietnamese export supply to the global market grew at an average annual rate of 18 per cent between 1961 and 2003. Other top exporters such as Brazil and Colombia increased their export supply by annual rates of only 0.3 per cent and 1.7 per cent, respectively, whereas export growth from other suppliers was approximately 1.6 per cent per annum. Another key supply-side development was technology adoption on Brazilian coffee farms that has allowed for steady production increases since the mid-1990s. With regard to the marketing aspect, producers in Brazil and several other countries have become more adept at risk management as a result of increased access to futures and financial markets. A major implication is that this has allowed some countries to stabilize their exports across wide cyclical production swings (Lewin et al. 2004). The lack of these technologies and expertise in other producing countries, particularly low-income ones, could obviously be a limiting factor in their capacity to smooth exports and minimize adverse price shocks.

On the demand side, the major change is the stagnancy of consumption growth in the traditional major importing countries. For example, the United States is the world's largest

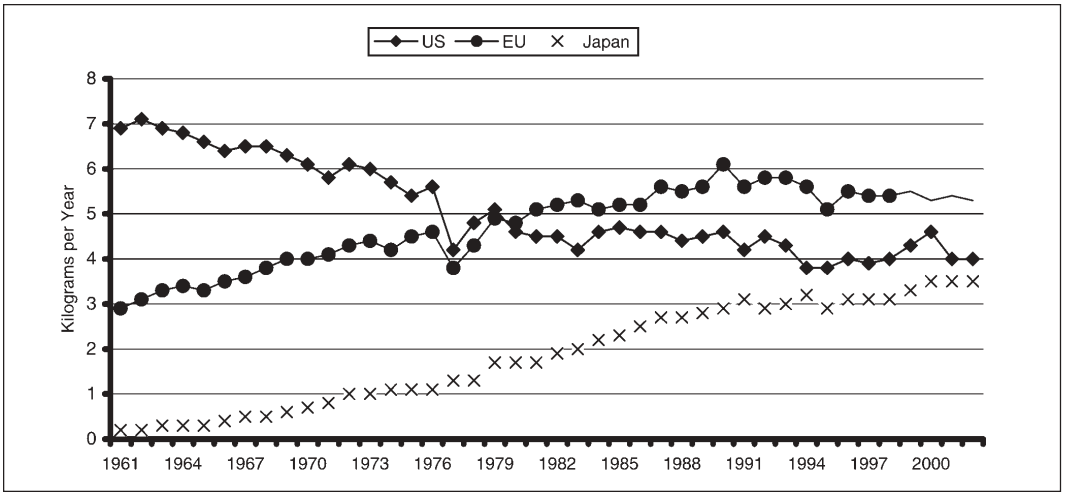
Figure 2
World Export Supply of Green Coffee: Metric Tons of Green Coffee



Source: FAO (2005).

coffee importer, yet per capita consumption has trended downward since the 1960s (Figure 3), declining from 6.7 kg in the 1960s to 4.1 kg in the 1990s (FAO, 2004). Substitution has been a major factor in this market, as consumer preferences have shifted away from conventional roasts and more toward differentiated coffee products. These include gourmet and specialty, organic, fair trade, eco-friendly or shade grown coffees, as well as those that emphasize geographic origin. This may explain some of the downturn in green coffee imports, which declined at an average annual rate of 0.5 per cent between 1961 and 2003. If one controls for population growth, green coffee imports are likely to decrease further (10%) in the future. We make this projection based on import and population growth data obtained from the Food and Agriculture Organization (FAO, 2005).

Figure 3
Per Capita Consumption of Coffee in the Three Largest World Economies



Source: FAO (2004)

Despite some expansion in the specialty coffee market, per capita consumption in the markets of Northern Europe has either stagnated or declined. Growth in the specialty coffee market is indicative of a geographic-generational shift in the popularity of different types of coffee products, in that there are marked changes in consumer preferences towards softer and less acidic coffees (Lewin et al. 2004). In Germany for example, per capita consumption and coffee retail prices have fallen considerably in the last few years although the demand for soluble products, such as instant cappuccino and flavored coffees, has increased. This is directly attributed to the entrance of younger consumers to the market, since they tend to consume coffee drinks at coffee bars outside the home. Conversely, the conventional roast and ground coffee markets are in decline, since older consumers tend to lower their intake of caffeinated drinks with increasing age (Lewin et al. 2004). In contrast, per capita consumption in the Southern European markets have been robust, particularly in Italy and Spain. For the EU overall, annual import growth was 2.2 per cent between 1961 and 2003. There is no significant change in imports if one controls for population growth.

In Asia, Japanese consumption has doubled in the last twenty years. This is commensurate with an average annual growth rate of 7.3 per cent for green coffee imports between 1961 and 2003. Differentiated product markets have expanded, and consumers have shown increasing preference for at-home consumption and liquid prepared coffees (Lewin et al. 2004). This niche market is likely to account for much of the expansion that could occur in the Japanese market in the future. Population growth is expected to play less of a factor in consumption trends, as the Japanese population growth rate is projected as turning negative before 2010 (ERS, 2005). Although tea is still the traditional beverage of choice in other Asian countries, emerging markets in South Korea and China in particular, have had favorable annual consumption growth rates. South Korean consumption has grown 2.6 per cent annually over the last ten years, with a strong preference for robusta coffees. Chinese consumption has grown more slowly, but there are indications that it would respond well to soluble and prepared drinks, as Japan has (Lewin et al. 2004).

Implications of the Changing International Trade Environment

Much of the structural change in the global coffee industry ensued after the collapse of the International Coffee Agreement (ICA) in 1989. The Agreement was signed in 1962 and included both producing and consuming countries as signatories. Prices were relatively stable for its duration (Akiyama & Varangis, 1990; Bates, 1997; Ponte, 2002), due to its price stabilization mechanism that set a band of $1.20/lb to $1.40/lb (Oxfam, 2002). Signatories agreed on pre-determined supply levels, and export quotas were allocated to each producing country. These were relaxed (tightened) only when prices exceeded (fell below) the band (Ponte, 2002a). Also, producing countries exerted greater control over their internal industries since their governments made all the relevant marketing and trade decisions. Given the mix of producing countries however, this level of efficiency could exist only as long as they were committed to the pursuit of a common import substitution development strategy, which was aimed at maximum mobilization of export earnings through high commodity prices. Therefore, when Brazil and Indonesia opted for export-oriented development strategies, and members could no longer agree on quota distributions and trade arrangements with nonmember countries, the ICA was seriously undermined (Ponte, 2002a). As noted previously, it finally disbanded in 1989, and almost immediately, coffee prices fell sharply because of increased exports from accumulated stocks (Akiyama, 2001).

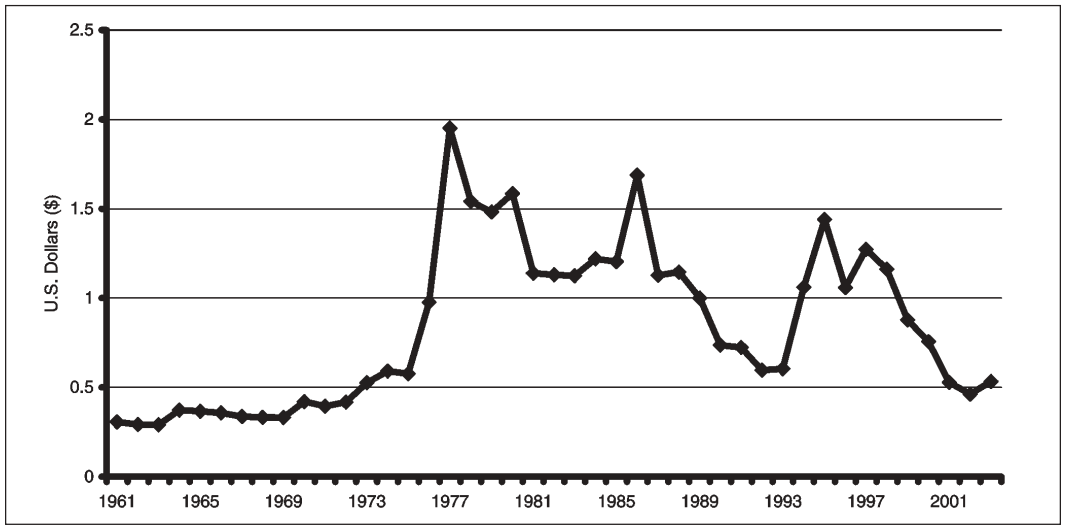
The dissolution of the ICA has had certain important implications for the coffee industry and, by extension, for producing countries. Prices are now set according to the New York Coffee, Sugar and Cocoa Exchange and the London International Financial Futures Market, and have tended to be lower and more volatile. Market power has also shifted in favor of consuming countries and their agents, therefore allowing for their retention of a higher proportion of the income generated along the coffee chain. According to Ponte (2002a), in the early 1980s producing countries retained 20 per cent of total income on average whereas consuming countries retained 55 per cent. Post ICA, (1989-1990 and 1994-1995), producers have retained only 13 per cent of the total income, whereas consuming countries have retained 78 per cent. This share is likely to have deteriorated further given the current imbalanced nature of the market and low prices. The industry has also undergone considerable restructuring, and become more concentrated

at the international trader and roaster levels. At the international trader level for example, the top six companies control 50 per cent of the market. At the roaster level, Nestle and Philip Morris control 49 per cent of global market share for instant and roasted coffees, and the top five companies control 69 per cent of the market (van Dijk et al. 1998). Although this tendency toward consolidation has increased efficiency to some extent, it has also been disadvantageous to producers. Consolidation has limited the range of opportunities that are available to producers, and constrained their leverage with regard to marketing and trade decisions. Smallholders and Small and Medium Enterprises (SMEs) have also had tremendous difficulty participating equitably in the markets (Lewin et al. 2004), particularly with regard to access to financing. A final implication of the ICA collapse is that producing countries have lost some capabilities for export control and maintenance of stock levels. Consequently, producer held stocks are the lowest in years (Ponte, 2002a).

Coffee prices have fallen considerably over time as a result of these developments (Figure 4). Ponte (2002a, pp. 1105) noted that the average real indicator price for 1990-1993 was only 42% of the average of the final four years (1985-1988) of ICA activity. Even after one accounts for the price increases of 1994-1997 due to frost and drought in Brazil, and the speculative hike of 1997, the average composite price for 1994-1997 was still 20% below 1985-1988. In some cases, prices have even plummeted below the cost of production for some producers - particularly those in low-income developing countries - and caused tremendous economic hardship for millions of families that are dependent on coffee for their livelihoods.

Although much of the price decrease arises from excess supply, it is also a consequence of declining average dollar prices of primary commodity exports from developing countries. Trade is an important source of revenue for many developing nations, and low-income countries are particularly dependent on exports of primary commodities and manufactures. However,

Figure 4
Global Import Prices of Green Coffee from 1961-2003 (1989=100)



Source: FAO (2004)

these commodities have lagged behind others in terms of global income growth. As such, low-income countries account for only 3 per cent of income generated though exports in the global economy (Ponte, 2002b). It is estimated that the prices of major agricultural commodities have fallen between 50 and 86 per cent in the last twenty years, with coffee showing the greatest fall (Osorio, 2004). In 2001 for example, the average price of primary commodity exports fell by 9 per cent, and coffee prices were down 30 per cent (Wasserman, 2002). Coffee earnings (expressed in terms of exports f.o.b) typically valued between US$10 and US$12 billion annually during the late 1980s and early 1990s, but have now fallen to US$5.5 billion (Osorio, 2004). For countries that are dependent on coffee, this precipitous drop in earnings is one of the major causes of poverty. This sentiment was expressed in a statement to the November 2003 United Nations General Assembly by Deputy Secretary General Louise Frechette, during which she stated that the loss of earnings has contributed to poverty and stymied efforts to reach Millennium Development Goals (UN Press Release, 2003). Given that coffee producers in developing countries now receive only a third of the price that prevailed in the 1990s, the lower revenue earnings are also threatening the success of the HIPC initiative for heavily indebted countries (HIPCs), some of which have experienced worsening debt indicators. The gravity of the situation for developing countries that produce coffee, even those with small shares of the global export market, is such that numerous nongovernmental organizations have recommended urgent action to mitigate the adverse impacts of the coffee crisis as it does not bode well for future economic development.

THEORETICAL FRAMEWORK

Since green coffee is an input that is transformed before reaching consumers, we use the production approach to derive input demand functions. The application of production approach to international trade is not a new concept. Some of the studies which have applied the production approach to international trade include Burgess (1974); Kohli (1978); Diewert and Morrison (1989); Truett and Truett (1998) and Washington and Kilmer (2002).

The global import production function of green coffee can be written as the sum of the production functions of imported coffee for the individual coffee importing firms:

$$h(q) = h_1(q_1) + \ldots + h_n(q_n), \qquad \ldots(1)$$

where $h(q)$ is the global import production function of green coffee; h_i (q_i) is the import production function for individual firms.

The global import production function is additive because the green coffee imported into one country is independent of that imported into another country. That is, the elasticity of output with respect to each country's import is independent of the import of other countries. For example, the elasticity of output of the U.S. importing firms with respect to their imports is independent of the imports of the E.U, or that of the Japanese firms. This condition is known as input independence (Theil, 1980).

Since the objective of firms in either the U.S. or the EU or Japan is profit maximization, the optimal firm behavior of profit maximization can hold at the global coffee industry level since the aggregate profit obtained when each firm is maximizing profit, taking prices as

given, is the same as that can be obtained if all firms were to make a joint profit maximizing decision (Mas-Colell, Whinston and Green, 1995). The fact that the production approach lends itself to such a consistent data aggregation makes the production approach appropriate for this study.

EMPIRICAL MODEL

Following Theil (1980), the global import (input) allocation model of green coffee derived from the differential approach under input independence can be specified as

$$f_i d(\log q_i) = \alpha_i + \theta_i d(\log Q) - \psi\theta_i d\left(\log \frac{p_j}{P'}\right) + \varepsilon_i, \qquad ...(2)$$

where f_i is the import share of coffee imported into country i; $d(\log q_i)$ is the log change in quantity of green coffee imported into country i; α_i is the import intercept of coffee imported into country i; θ_i is the marginal share of coffee imported into country i; ψ is the Divisia volume index flexibility; $\psi\theta_i$, which is the product of the Divisia volume index flexibility and the marginal share of coffee imported into country i, is the price coefficients; $d(\log Q)$ is the Divisia volume index; p_j is import price; $d(\log P') = \sum_{i=1}^{n} \theta_i d(\log p_i)$ is the Frisch price index; and ε_j is the error term.

The Divisia input volume and Frisch price indexes are weighted means of logarithmic quantity and price displacements, respectively (Theil, 1980). The Divisia index of inputs is made up of the logarithmic rates of change of imports, weighted with their respective import shares (f_i) in overall outlays for imports: $d(\log Q) = \sum_{i=1}^{n} f_i d(\log q_i)$. The Frisch price index of inputs is made up of the logarithmic rates of change of import prices, weighted with their respective marginal import shares (θ_i) in overall outlays for imports: $d(\log P') = \sum_{i=1}^{n} \theta_i d(\log p_i)$. The weights of the Divisia index and Frisch price index have unit sums.

The Divisia volume index elasticity (ε_{qQ}) and conditional Slutsky price elasticities (ε_{qp}) are derived by differentiating Equation (2) with respect to the Divisia volume index and prices.

$$\varepsilon_{qQ} = \frac{d(\log q_i)}{d(\log Q)} = \frac{\theta_i}{f_i}. \qquad ...(3)$$

$$\varepsilon^{S}_{qp_i} = \frac{d(\log q_i)}{d(\log p_i)} = \frac{\psi\theta_i(1-\theta_i)}{f_i} \quad . \qquad ...(4)$$

$$\varepsilon^{S}_{qp_j} = \frac{d(\log q_i)}{d(\log p_j)} = \frac{\psi\theta_i\theta_j}{f_i} \quad . \qquad ...(5)$$

DATA AND ANALYTICAL METHODS

Data for this study came from the Agriculture and Trade section of the web page maintained by the Food and Agricultural Organization (FAO, 2004; 2005). The annual quantities (Mt) and values ($ 1000) of green coffee imported into the U.S, EU-15, Japan and the rest of the world (ROW) were obtained for 1961 to 2003. The values of imports are on a cost, insurance, and freight (CIF) basis, which include costs of the product, insurance, and transportation. To proxy commodity prices, unit import values ($/kg) were obtained by dividing import values by import quantities.

The method used to estimate the system of demand equations for coffee is Full Information Maximum Likelihood (FIML) in Time Series Processor program (TSP4.4). This method is based on the entire system of equations, and estimates all parameters jointly. When estimating the system of demand equations, one of the equations was deleted to avoid singularity in the covariance matrix. However, parameter estimates of the deleted equation were recovered by re-estimating the system with another equation in the system. Parameter estimates are invariant to the deleted equation when using maximum likelihood estimation (Barten, 1969). With normally distributed disturbances, the full information maximum likelihood method has all the desirable asymptotical properties of Maximum Likelihood (ML) estimators and, therefore, is asymptotically efficient among all estimators (Greene, 2000). The Likelihood Ratio test was used to test serial correlation and homotheticity.

RESULTS

First, we investigate the stationarity of the data to be used in Equation (2). A time series is stationary if its mean, variance, and auto covariance are independent of time. The stationarity of a time series variable implies that the series possesses the desirable linear statistical properties, such as time invariant conditional mean, variance, and auto covariance. If the series is non-stationary, the standard t-test is no longer valid. The test of stationarity can be done using various tests such as Weighted Symmetric (WS), the Phillips-Perron (PP), and Dickey-Fuller (DF) tests. In this paper, we apply the WS test, which is recommended over the DF test because of its higher statistical power.

Results of the WS test indicate that the null hypothesis that all the level variables contain a unit root cannot be rejected, implying that the level variables are non-stationary. In order to render the data stationary, we differenced the series and applied the WS test, which indicates that the first differenced variables that are actually used in our model are stationary (Table 1), and our model is thus a short run model. Since we are using first differenced data in our model, only the unit root test of the differenced data series used in the model is presented in Table 1.

Table 1
Test of Stationarity Using Weighted Symmetric test

Variables	*Calculated value*
f_1 d(logq_1)	-4.3087***
f_2 d(logq_2)	-3.9361***
f_3 d(logq_3)	-3.6541**
f_4 d(logq_4)	-5.2629 ***
d(log Q)	-4.5856 ***
d(log p_1)	-3.1663 **
d(log p_2)	-3.1810 **
d(log p_3)	-3.0743*
d(log p_4)	-3.2543 **

***, (**) and (*) denotes statistical significance at 1%, 5% and 10%, respectively

Following the test of stationarity, we conducted the likelihood ratio test to test for serial correlation. Results indicate that the null hypothesis of no serial correlation is rejected, implying that the data is serially correlated (Table 2). Hence, applying the HILU procedure (Hildreth and Lu, 1960), we chose the optimum coefficient of serial correlation ($\rho = -0.39$) and corrected the problem in question.

Table 2
Likelihood Ratio (LR) Test Results for Autocorrelation, and Homotheticity

Model	*Log-Likelihood Value*	*Model Chi-square*	$P[\chi^2_{(df)} \leq LR] = 0.95$
AR (1)	421.066		
No AR (1)	412.277	17.578	3.84(1)
Homotheticity	412.254	17.624	7.81(3)

We also tested for homotheticity (i.e. unitary Divisia elasticities) by replacing the marginal factor share coefficients with the average expenditure shares. Following Theil (1980), Equation (2) under homotheticity is given as

$$f_i d(\log q_i) = \alpha_i + f_i d(\log Q) - \psi f_i d\left(\log \frac{p_j}{P'}\right) + \varepsilon_i \,. \qquad ...(6)$$

The likelihood ratio test indicates that the log likelihood value of the model under homotheticity is 412.254, while that of the model without homotheticity is 421.066, giving a model chi-square statistic of 17.624. Given that the calculated model chi-square is greater than the critical value, we conclude that homotheticity is rejected (Table 2). This implies that the global import production function (equation 1) is non-homothetic in the imports of the world's largest economies.

Table 3 presents the parameter estimates of the derived demand for coffee (equation 2). Intercepts were included to capture possible time trends and serve to test for structural changes

in the demand for coffee in each economy. Results indicate a decrease in demand for green coffee in the U.S. and an increase in the EU, Japan, and the ROW. The decrease in the U.S. demand was larger than the increase in the EU and Japan combined. This is consistent with Figure 1 where the per capita consumption of coffee in the U.S. has been declining while that the E.U and Japan has been trending upwards.

Table 3
Conditional Parameter Estimates of the Demand for Coffee in the World's Largest Economies

Country	*Intercept*	*Marginal factor shares*	*Price Coefficients*
U.S.	-0.0116***	0.4700***	-.15936**
	(0.0037) [a]	(0.0595)	(0.0784)
EU	0.0062***	0.3907***	-0.1324**
	(0.0023)	(0.0484)	(0.0603)
Japan	0.0023**	0.0424***	-0.0144**
	(0.0011)	(0.0143)	(0.006)
ROW[b]	0.0031*	0.0969**	-0.0328*
	(0.0019)	(0.0391)	(0.0171)

***, (**) and (*) denotes statistical significance at 1%, 5% and 10%, respectively.
[b]Row is rest of the world.

The conditional marginal factor share estimates indicate a positive relationship between the Divisia volume index of total imports and the imports of green coffee in each economy. Of each additional dollar spent on green coffee in the world coffee market, U.S. importers pay the largest proportion (47%) followed by the EU (39%), the ROW (10%) and Japan (4%). Results also indicate that the own price coefficients are all negative and statistically significant, implying that prices are important determinants of the global coffee market.

Table 4 presents the conditional Divisia index elasticities and Slutsky price elasticities calculated at the sample means. The Divisia index elasticity of coffee imported into country *i* (i.e. the elasticity of the demand for coffee imported into country *i* with respect to the Divisia volume index of global coffee imports) show the per centage change in imports of green coffee in each economy for a one per cent change in global imports. The Divisia index elasticity indicates a similar relationship as the total import elasticity (Washington and Kilmer, 2002). The Divisia volume index elasticities, which are the input version of the income elasticity of a consumer good (Theil, 1980), are all positive and statistically significant. With prices held constant, for a one per cent change in global imports, the U.S. imports of green coffee change by 1.5313 per cent while imports of the EU and Japan change by 0.8230 per cent and 0.8758 per cent, respectively (Table 4).

The demand for green coffee in the three largest world economies is price inelastic, implying that a one per cent decrease in prices will lead to a less than proportionate increase in coffee imports in these markets. This is consistent with McClumpha (1988) who notes that the international coffee market is characterized by relatively low price elasticities of demand. The U.S. demand (-0.2750) and Japan's demand (-0.2842) are almost equally price inelastic while the EU demand (-0.1699) and the ROW demand (-0.1745) are almost equally inelastic. The low price elasticities of demand observed in the world's largest economies imply that expansion of global export supply is not a viable option for exporting countries to increase export earnings.

Rather, expansion of exports will worsen their terms of trade. The low price elasticities will lead to highly variable prices in the world coffee market (Ponte, 2002a). In the current situation of declining world coffee prices, the U.S. and Japan increase their demand relatively more than the EU and the ROW. The positive and statistically significant Slutsky cross price elasticity implies that the change in import price of coffee in one country will indirectly affect the demand for coffee in another country.

Table 4
Conditional Divisia and Slutsky Price Elasticities of the Demand for Coffee in the World's Largest Economies

Country	*Divisia Elasticity*	*Conditional Slutsky cross Price Elasticities*			
		U.S.	*E.U.*	*Japan*	*ROW*
U.S.	1.5313***	-0.2750**	0.2027**	0.0220**	0.0503**
	(0.1940)[a]	(0.1227)	(0.0987)	(0.0096)	(0.0254)
E.U	0.8230***	0.1311**	-0.1699**	0.0118**	0.0270**
	(0.1020)	(0.0638)	(0.0753)	0.0050)	(0.0136)
Japan	0.8758***	0.1395**	0.1159**	-0.2842**	0.0288
	(0.2949)	(0.0606)	(0.0494)	(0.1220)	(0.0198)
ROW[b]	0.5702**	0.0908**	0.0755**	0.0082	-0.1745**
	(0.2300)	(0.0459)	(0.0381)	(0.0056)	(0.0867)

[a]Asymptotic standard errors are in parentheses.
[b]Row is rest of the world.
***, (**) and (*) denote statistical significance at 1%, 5% and 10%, respectively.

CONCLUSIONS

This study was aimed at analyzing the import demand for green coffee in the world's largest economies and drawing implications for producing countries. Results confirm that the demand for coffee in U.S., EU and Japan has undergone significant changes over the past four decades. The U.S. demand has decreased while that of the EU and Japan increased. However, the level of decrease in the U.S. was larger than that of the increase in the EU and Japan combined. Hence, given the large size of the U.S. market, the decline in the world coffee market prices can be partly attributed to the decrease in the U.S. demand. Factors attributed to the decline in U.S. demand include lifestyle changes and increased consumer awareness about the health effects of caffeine consumption (Houston, et al. 2003).

Based on the estimates of Divisia import index elasticities, we provide a sense of the response of each country's coffee industry to changes in the global coffee economy in relation to the total volume of global imports. Results indicate that the U.S. demand is more sensitive than the Japanese and EU industries to changes in the global coffee economy. This implies that the market share of the U.S. coffee industry will increase with the expansion of the world coffee economy and decrease with the recession of the same. The opposite will hold for the Japanese and EU coffee industries. This is evident in the fact that the U.S. market share has been declining while that of the EU and Japan have been increasing over the last three decades during which the world coffee economy has experienced a slow growth of demand (recessionary situation). These results imply that expansionary global trade policies (i.e. demand-side policies that will stimulate the global coffee demand) may reverse the declining trend of the U.S. coffee market shares.

Given the price inelasticity of the demand for coffee in the world's largest economies, producing countries will be worse off and importing countries (U.S., EU and Japan) will be better off with the expansion of production since the expansion of global export supply will worsen the terms of trade of developing countries. Because the market shares of the United States and the European Union are larger than that of Japan and the ROW, the larger benefits from price drops associated with increased production or export supply go to the U.S. and the EU than Japan and the ROW.

Implications for Producing Countries

For coffee-producing countries to survive in this new paradigm of demand shifts and lower prices, it is evident that new strategies that emphasize non-price competition have to be employed. Given increased consolidation in the global industry, international traders and roasting companies have placed more emphasis on consistency in the provision of quality coffees. To remain viable in this competitive environment, producing nations must be poised to meet these demands. This may require significant investment at all production levels, which larger low-cost producers would possibly accomplish more easily than smaller producers. However, producer and trade organizations in all producing countries could facilitate the adjustment to the new competitive framework by providing the coffee farmers and local exporting companies with essential services that allow for more direct linkages with international traders and roasting companies.

Moreover, the changing demand preferences would seem to denote a need for more differentiated products. Producing countries should seek to establish systems of appellation that would emphasize distinct origins, defined processes, or special characteristics, as they would be able to retain a larger segment of value added activities within the global coffee chain. At the present however, the inherent disadvantage to these market segments is that they are still small and difficult to access. Also, producers should be made aware that the existing price premiums would not last in perpetuity.

The downturn in consumption in certain market segments, coupled with the fact that producing countries account for only 25 per cent of global consumption, would seem to imply that any attempt to mitigate the coffee crisis should involve local campaigns to increase domestic consumption. These could help to offset demand slumps in traditional markets, and are currently being pursued by larger producers like Brazil.

The aforementioned strategies may not work for all producing countries, and with that realization, other options must be considered. Diversification has long been touted as a possible solution for smallholders in low-income countries, in order to lessen the dependence on coffee earnings and the vulnerability to price swings. However, the lack of viable alternatives in rural communities and trade protectionism in industrialized country markets continue to be major obstacles. The latter, in particular, should be addressed if a market-based approach is ultimately the best solution for mitigating the coffee crisis for developing countries.

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