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Foreign Direct Investment and Retailing: The Road Ahead

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Abstract

Indian retail sector is highly fragmented as compared to the developed as well as the other developing countries. This shows a great potential for the organized retail industry to prosper in India, as the market for the final consumption in India is very large. Retail trade is largely in the hands of private independent owners and distributor’s structure for fast moving consumer goods consisting of multiple layers such as carrying and forwarding agents, distributors, stockiest, wholesalers and retailers. Thus, the growth potential for the organized retailer is enormous. The purpose of this paper is to provide an examination of foreign direct investment in retailing.

FDI inflow rose by 50 per cent to US $ 20.76 billion during January-August 2011, while the cumulative amount of FDI equity inflows from April 2010 to August 2011 stood at US$ 219.14 billion, according to the latest data released by the Department of Industrial Policy and Promotion (DIPP). Services (financial and non-financial), telecom, housing and real estate, construction and power were the sectors that attracted maximum FDI during the first eight months of 2011 while Mauritius, Singapore, the US, the UK, the Netherlands, Japan, Germany and the UAE, among others, are the major investors in India.

At present the organized retailing in India is witnessing considerable growth. A number of large domestic business groups have entered the retail trade sector and are expanding their operation aggressively. Several format of organized retailing like hyper market; supermarkets and discount stores are being set up by big business groups besides the ongoing proliferation of shopping malls in the metros and other large cities. Successful retail organizations must understand their market, their customers and the importance of strategic location. Because of competition in the retail industry can be fierce, such organization need the best micro marketing tools available to analyses where to place new stores, establish customer profile, and determine best marketing practices in order to find new customers.

Keywords: foreign direct investment, service sector, economic survey, commercial business, retail industry, micro marketing, customer profile.

JEL Classification: A11

1. Introduction

Indian retail sector is highly fragmented as compared to the developed as well as the other developing countries. This shows a great potential for the organized retail industry to prosper in India, as the market for the final consumption in India is very large. Retail trade is largely in the hands of private independent owners and distributor’s structure for fast moving consumer goods consisting of multiple layers such as carrying and forwarding agents, distributors, stockiest, wholesalers and retailers. Thus, the growth potential for the organized retailer is enormous. The purpose of this paper is to provide an examination of foreign direct investment in retailing.

2. Impact of Retailing

No one can deny the fact that the present retail sector is unorganized and the multiple point of sale between the farm-gate and the consumer leads to wide disparity between the price paid to the farmer, and the one paid to the consumer, but the setup also provides job to millions. The organized retail would control prices and contain inflation as is voiced by the reformers is unlikely to happen in India. Once they enter the country and setup shot, global retailers with their enormous monopolistic power to manipulate the markers can actually pay less and charge more. Also the big foreign retailer would have necessarily operated in urban milieu because he
needs a large market and whatever benefit he would be for the urban elite. This surely would lead to further urban – rural socio economic tensions.

3. FDI in Service Sectors

In India the service sector accounts for 55 percent of India’s Gross Domestic Product. It growing by 10 percent annually, contributes about a quarter of total employment and over one-third of total exports and then is growing at a fast rate. It is emphasized that we have to sustain a high growth of the service sector. It is true to say that to tap the full potential of the service sector, policy reforms are needed.

Among the various policy reforms, the single one that can contribute most to the further growth and maturing of India’s service sector is making it easier for foreign direct investment in services. However, the issue has become intensely contested. FDI window into services has been opened only slightly. Many areas of the services sector are altogether out of bounds for the foreign direct investment. But despite severe restrictions, the service sector has attracted not less than 44 percent of the total FDI equity flows between April 2000 and December 2010 in only four sectors, namely financial and non-financial services computer hardware and software, telecommunications, housing and real estate.

If the construction sector is included then the share of the service sector in the total equity flows will jump to 51 percent. Of these sectors financial and non-financial companies have attracted the largest FDI equity flow with a share of 21 percent. Larger FDI flows can radically improve some of the India’s critical services sector and help overcoming the challenges that are before India’s service economy to day. The Economic Survey of 2010 clearly pointed out that the three challenges.

**Figure 1.** Foreign direct investors in India

![Pie Chart: Foreign direct investors in India](image)

**Source:** Department of Industrial Policy and Promotion 2010, Ministry of Commerce and Industry, Government of India

**Table 1.** FDI in Service Sector Inflow (2006 – 2010)

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<td>Service sector (financial and non-financial)</td>
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<td>23640</td>
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<tr>
<td>2</td>
<td>Computer (software and hardware)</td>
<td>2614</td>
<td>1410</td>
<td>1677</td>
<td>919</td>
<td>9872</td>
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<td>3</td>
<td>Telecommunication (radio paging, cellular mobile, basic telephone service)</td>
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<td>2558</td>
<td>2554</td>
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<td>2844</td>
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<td>8</td>
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<tr>
<td>5</td>
<td>Construction (including roads and highways)</td>
<td>985</td>
<td>1743</td>
<td>2028</td>
<td>2868</td>
<td>8059</td>
<td>7</td>
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<td>6</td>
<td>Power</td>
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<td>967</td>
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<td>1437</td>
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<td>8</td>
<td>Metallurgical industry</td>
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<td>407</td>
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<tr>
<td>9</td>
<td>Petroleum and Natural Gas</td>
<td>89</td>
<td>1427</td>
<td>412</td>
<td>272</td>
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<td>229</td>
<td>749</td>
<td>362</td>
<td>2496</td>
<td>2</td>
</tr>
</tbody>
</table>

**Source:** Department of Industrial Policy and Promotion 2010, Ministry of Commerce and Industry, Government of India

4. Developmental considerations

In the late 1990’s the retail sector has witnessed marked transformation. Retailing is perceived as a beginner and as an attractive commercial business for organized business i.e. the pure retailer is began to emerging now. Organized retail business in India is very small but has tremendous scope. The total in 2005 stood at $ 225 million, accounting for about 11 percentage of GDP. In this total market, the organized retail accounts for only $8 billion of total revenue.

Organized retailing will now grow faster than unorganized sector and growth speed will be responsible for its high market share, which is expected to be $17 billion by 2010-2011. According to Confederation of Indian Industries, in New Delhi has the good resources and good condition for the retail sector. Out of the total earnings of the Government of Delhi Rs 11000 crore, Rs 6500 crore is achieved from the retail sector.

5. FDI and economic performance

- FDI inflow rose by 50 per cent to US $ 20.76 billion during January-August 2011, while the cumulative amount of FDI equity inflows from April 2010 to August 2011 stood at US$ 219.14 billion, according to the latest data released by the Department of Industrial Policy and Promotion (DIPP).
- Services (financial and non-financial), telecom, housing and real estate, construction and power were the sectors that attracted maximum FDI during the first eight months of 2011 while Mauritius, Singapore, the US, the UK, the Netherlands, Japan, Germany and the UAE, among others, are the major investors in India.
- India’s foreign exchange (Forex) reserves have increased by US$ 858 million to US$ 318.4 billion for the week ended October 21, 2011, according to the weekly statistical bulletin released by the Reserve Bank of India (RBI). In the considered week, foreign currency assets went up by US $ 861 million to US$ 282.5 billion, while the gold reserves stood at US $ 28.7 billion.

6. Emerging trends in Indian Retail Industry

The Indian retail environment has been witnessing several changes on the demand side due to the increased per capita income, changing life style, and increased product availability. The traditional format like hawkers and grocers coexists with modern format like supermarkets and non-store retailing channels such as multilevel marketing and teleshopping modern stores tends to be large, carry more stocks, keeping units, and have a self-service format and an experimental ambience.

In recent years there has been a slow spread of retail chains in some format like supermarket, malls, and discount stores. Factors facilitating the spread of chains are the availability of quality products at lower prices, improved shopping standards, convenient shopping and display and blending of shopping with entertainment. Cities like New York, Los Angles, Vancouver, London, Paris, New Delhi, Mumbai etc. are booming and expanding in retail business due to their strategic approach in deciding facilities, customer services, retail visual and their prompt responses on customer requirements.

7. Development of retailing

The Birlas have marked their presence by acquiring Madura Garments, while Reliance plans to develop its retail venture and fuel retail network simultaneously. Even the public sector companies like HPCL, IOCL, and BPCL realized their potential for entering in to retailing by leveraging their supply chain network.
On the one hand, the advancement of information technology is improving end to end business processing by integrating the entire value chain, backward and forward, for operational efficiencies. On the other hand, rising real estate prices, infrastructural constraints, and expensive technology are making the retail industry capital intensive. The governments of India prohibit FDI in retail except for single brand joint ventures with up to 51 percent equity share. The recent growth of the retail industry has already made impact on the commercial real estate sector.

8. Conclusion
At present the organized retailing in India is witnessing considerable growth. A number of large domestic business groups have entered the retail trade sector and are expanding their operation aggressively. Several format of organized retailing like hyper market; supermarkets and discount stores are being set up by big business groups besides the on-going proliferation of shopping malls in the metros and other large cities. Successful retail organizations must understand their market, their customers and the importance of strategic location. Because of completion in the retail industry can be fierce, such organization need the best micro marketing tools available to analyze where to place new stores, establish customer profile, and determine best marketing practices in order to find new customers.

References
International Mobility of Labor in the Informal Sector

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Abstract
Increasing levels of international migration is countered by progressively restrictive immigration barriers, which leads to a substantial number of people who use irregular channels of migration and foreign employment. Growing proportion of migrants which moves without entry clearance is combined with those who resort the procedures of asylum without meeting the conditions of refugee status or other forms of protection. Migration-asylum combination affects a number of concerns, such as the actual management of borders, identifying legitimate claims for asylum from this mix flows, trafficker’s network discovery etc. The potential to find a job is a key factor that encouraging illegal immigration into the European Union (EU).

Keywords: international migration, employment, black labor, undeclared work.

JEL Classification: J21, J08, J64

1. Introduction
Currently all EU Member States are affected by international migration flows. These agreed to develop a common policy on immigration at the European level. The Commission has made numerous proposals for development of this policy; many of them have become an integral part of EU law. The main objective is better management of migration flows through a coordinated approach that takes into consideration economic and demographic situation of the EU. Despite restrictive immigration policy that exists in many Member States still the 70s, a very large number of illegal immigrants have continued to enter the EU together with those seeking asylum. Taking advantage of persons who came in search of a better life, many traffic and smuggling networks have appeared in the EU. This situation led to the necessity of allocating considerable resources to fight against the illegal immigration, particularly regarding traffickers and smugglers. Furthermore, it is a known fact that the EU needs the immigrants in certain sectors and regions in order to satisfy its economic and demographic needs.

EU must intensify their efforts to reduce the informal economy, a real ‘pull factor’ for illegal migration, used as a catalyst for exploitation. Commission proposed that future priorities in the fight against illegal immigration should reduce illegal employment developed by citizens illegally staying from third countries. The Commission also continues to prioritize work on agreeing of common standards and procedures for the return of third country citizen’s illegally staying, negotiation and future conclusion of readmission agreements with third countries relevant.

2. Undeclared work phenomenon
Black labor continues to be a problem in the European Union member states. Hidden economy undermines the financing of social security systems, hinder the deployment of economic policies consistent and can lead to social dumping. Black labor is practiced mainly in the states of Eastern Europe. In the EU-27 5% of employees admit that they got ‘salaries in envelopes’, ranging from 3% in most Member States to 10% in some countries in Central and Eastern Europe. Most working people in black are the students, the unemployed and freelancers and, areas that used mostly this practice are construction and services for household.

The existence and expansion of informal work for both migrants and the population from the more developed countries of the EU is largely correlated to the institutional aspects of the economy, which differs in each of the Member States, such as:
- Tax wedge – taxes and social contributions; level of taxes and social contributions level certainly affects undeclared work. An overwhelming tax is an incentive for underground economy manifestation to both the
employer and the employee. The phenomenon is caused, on the one hand, by the level of taxes and social security contributions and on the other hand, by structure. In countries where income taxation is raised, the pressure comes from labor force offer and undeclared work is a feature especially to those who work on their own; in countries where the level of social security contributions is raised, the pressure comes from the demand for 1. Introduction so the undeclared work tends to be done in the form of businesses with activity – completely or partially – informal, undeclared.

In Romania undeclared work phenomenon is generated and favored, among others, because of excessive bureaucracy and to high level of fees, taxes and social contributions due by employer and employee. Therefore, within the contributions paid by the employer are summarized:

- Social insurance: 20.8 percent for normal working conditions, 25.8 percent for extraordinary working conditions, 30.8 percent for special working conditions,
- Unemployment insurances: 0.5 percent of gross monthly salary fund,
- Health social insurance: 5.2 percent of gross monthly salary fund,
- National Fund for work accidents and occupational diseases – between 0.15 percent and 0.85 percent of gross monthly salary fund,
- Guarantee Fund for salary debts payment: 0.25 percent of gross monthly salary fund,
- Holidays and health insurance benefits: 0.85 percent of gross monthly salary fund.

The contributions borne by the employee (and withholding) are: social insurance: 10.5 percent of gross monthly salary, unemployment insurances: 0.5 percent of gross monthly salary, health social insurance: 5.5 percent of gross monthly salary.

If we follow the fiscal level in other Member States according to publicly available information, in this regard, in Finland are applicable the following taxes and contributions:

- the income tax applies to progressive quota and ranges between 7 percent (for an income between 13,000 EUR and 21,700 EUR) and 30.5 percent (for an income greater than 64,500 EUR),
- in addition to the income tax for annual earnings greater than 2,200 EUR shall apply a municipality fee that varies between 16.5 percent and 21 percent.

The contributions incurred by the employer include: social insurance: between 2 percent and 5.10 percent of gross salary, life insurance (unless it is provided through collective labor agreements applicable): 0.08 percent of gross salary; accidents at work: 1 percent of gross salary, unemployment insurances: between 0.65 percent and 2.65 percent;

In the contributions supported by the employer are included: unemployment insurance: 0.34 percent of gross salary.

According to publicly available information in this regard, the following taxes and contributions are applicable in Luxembourg: income tax applies in progressive quota that varies between 0 percent and 38.95 percent, employees longer bear the costs related of a housing provision in amount of 1.4 percent of salary;

Both the employee and employer endure the following contributions: Health insurance: 2.95 percent of an employee’s salary (for both the employee and the employer) Social Insurance: 8 percent of an employee’s salary (for both employee and employer).

Also, the employer shall endure the following contributions: health at work: 0.11 percent of all its employees’ salary, insurance against accidents at work: between 0.43 percent and 5.92 percent, according to the employee professional activity.

The bureaucracy and administrative tasks: excessive bureaucracy and administrative procedures (for example, registration of service provider or employer-employee relationship formalization) contribute towards dissuading declaring their work. In the second case, both types of relation (employers and employees) will notice and take advantage of its non-declaration. The existence of handicraft cooperation can also lead to informal work. In some countries, membership of a professional association is required in order to exercise certain professions. If, on the one hand, the existence of these associations ensure the quality of products or services, on the other hand, can act as barriers to competition with non-members which, therefore, are tempted to exercise their profession on a clandestine basis.

Deficitary legislation, inadequate in terms of the labor market: insufficient mediation and knowledge of national legislation which allows the pursuit of new types of work program limits the labor force information about the practical options that may choose, such as:

- Atypical work program, which involves a certain degree of flexibility in working hours: non-standard working hours, usually determined by mutual agreement between employer and employee, at
employment in certain times of the month, the year, etc.),
- Partially working program of different types: (a) limited number of hours of work per day, but with daily work schedule, (b) reduced working week - 8 hours per day, but only 2 or 3 days / week, (c) reduced working month - 8 hours daily, but only two working weeks per month,
- Fixed-term employment contracts: (a) fixed term of the contract, for example six months or (b) until the exclusion of the product or service requested by the customer.

Limited knowledge of current legislation for new types of work can constrain individuals to resort to informal work. When workers know their rights, informal risk is much lower.

**The demographic structure of enterprises:** In the areas where the labor market is dominated by a few large companies, the underground economy is relatively insignificant, instead in local economies where small and even micro enterprises prevail, the probability of employment manifestation and the informal economy is very high.

**Low competitiveness:** recourse to undeclared work can be determined by the need of lower cost for companies in certain activity sectors in decline who otherwise would not be able to survive in a competitive market. However, long-term, it is difficult for undeclared sector to maintain competitiveness in the race, because it is disorganized and requires a high degree of mutual trust between the operators that hamper the enrichment phenomenon that would take place in a closed circuit.

**Cultural profile:** in some local areas, the informal economy is not perceived as a negative phenomenon. On the contrary, it is fully supported and is considered as an exchange of services or mutual aid that does not require to be told (providing clean, seasonal work in agriculture).

**The existence of opportunities:** each individual chooses whether or not to undertake undeclared work, weighing the advantages and disadvantages of black labor: in the first case, obtaining immediate gains, untaxed, in the second case, the risk of being caught, the sanctions whether it is caught or, in some cases, moral issues. In other words, the more an individual has the opportunity to pursue an undeclared work with a low risk of being discovered (because controls, because it is already covered in terms of insurance husband / wife) the temptation to take advantage of the opportunity will be greater, so informality continues to exist.

Under the name of ‘black labor’ illegal work under-declared or undeclared work are summarized gainful activities carried outside or at the limit of legal provisions and regulations: social legislation (occupational accidents medical leave, retirement and unemployment insurance fiscal legislation [a large part of taxes is related to labor income]) labor legislation (labor women, children, working time).

The motivation of undeclared work practice is very diverse and is, usually, an economic character well pronounced. Economic specifics of certain periods, the tradition, and the legislation are elements that determine the behavior of citizens. Clandestine work allows to the one who’s practice to increase its resources and the one who utilizes it - should reduce its costs and, respectively, both - should avoid fiscal and social costs. This can be motivated equally by administrative constraints, such as situations of cumulative income, taxed at the maximum rate.

Participants in black labor usually are the following categories: low qualified persons, constrained to accept underhand jobs, finding none other official labor market opportunities, minors, students, unemployed, pensioners, low-salary groups and low level of education, people who have difficulties with social integration.

‘Black Labor’ is accepted by those who take a second job or those who don't want to work after tighter rules, but preferring a free labor from the point of view of the constraints. On the other hand, even the employers who usually respect the law with regard to employees are not afraid to use illegal employment for employees with a seasonal or poor training, possibly employees in sample.

The underground economy is essentially a phenomenon that depends on the way is occupied the labor force. Where governments do not offers job opportunities, in underground economy are arising ample employment opportunities of a job. These services are offered to those that are not officially employed and this despite the siege of governmental authorities. Norms concerning minimum salary is actually an governmental provision that requires employees to not accept to work for a salary below the established limits and employers to pay salaries above this limit or not engage at all. Beyond the economic and social arguments in favor of such provisions, these shall refuse the access at a job appropriate to their training and their skills for a large number of persons: for them, the underground economy provides hope and opportunities.

Poverty in combination with the lack of legal employment opportunities leads people to look for alternative strategies of survival, often in so-called informal employment (illegal employment or ‘black labor’), or migration, or both combined. Informal employment itself can often result to poverty, depending on the type of occupancy and
national specific context, and the period of time. Informal employment (‘black labor’) refers to work performed outside the legal framework because they are not subjected to labor legislation, social security, taxation or employment related benefits.

Based on this definition, has been identified the next groups of workers:

- own account workers and employees of informal enterprises,
- contributing family workers,
- illegally employed (formal or informal within the companies).

Reasons for the labor existence in the informal sector may be connected to: undeclared employment by employers in order to avoid taxation, engaging in random jobs or short-term, to avoid paying the minimum salary, job placement outside the perimeter of the employing company without a contract of employment.

The concrete economic situation existing at a particular time imposes to citizens an immediate reaction to ensure the survival, and some traditions have strong influences. However, legal regulations that prevail in society determine the boundary between what is accepted and the conditions for accepting what society rejects.

Therefore, the legislation establishes mainly, the following:

- minimum and maximum age limits for pursuit of certain trades, protection and prohibiting particularly the exploitation of children,
- conditions of a technical nature and labor rules protecting specific to each domain,
- the limits of the working time, rest, conditions that must be provided to workers,
- measures to protect the labor force in each state or, where appropriate, for attracting labor from other countries.

Undeclared work, as a generic name, refers both to services provided in clandestine conditions as well as those undeclared to the true value (so-called illegal work undeclared). For this reason, labor undeclared lead to alterations in labor market equilibrium, because is achieved a disturbance between demand and supply of labor force and, therefore creating a parallel labor market and with a pronounced informal character (where is negotiated an parallel price of work: the ‘black’ salary, minor eludes payment of fiscal obligations related and that is why, more attractive in net amount and in the immediate perspective than that prevailing at the official labor market).

Work outside the legal framework is present and manifests itself in several forms, such as:

- unfulfilled activity, total unstressed and not taxed, carried outside the individual labor contract or civil convention, without legal drafted payroll and payment of the obligations to the state budget, without timesheet for emphasizing time norm, without the normal production documents and the way of work and without naming in any way the person who performs the work,
- work partially not highlighted and not taxed, achieved by double evidence of so called payment ‘in hand’ representing addition to evidence of documents,
- incorrect prominence of production carried by the rules of exhausting time, more than 8 hours, a worker being abused and being at the discretion of the employer,
- labor on understanding of 3 hours a day, that actually is carried within the range of 8-12 hours per day,
- speculate, illicit trade and smuggling,
- occasional work in the season,
- the domestic activity in population households,
- work in so-called, ‘probation period’ not highlighted in documents.

Work ‘at Black’ is labor in all sectors of the economy, where money are handled cash, context in which commercial activities in the most extensive sense of the term, is the favorite area of the event.

The causes of undeclared work are extremely varied, they have a multifactorial determination and are related to the economic situation of the employee and employer at some point, the level of their training and last but not least, legal framework and the sanctioning regime. For EU countries we appreciate as significant the following causes:

- amount of income tax and contributions to social insurance system,
- the existence of complicated administrative procedures and bureaucratic,
- labor laws not adapted to the labor market and to the development needs of society,
- development of subcontracting chains that increases the number of independent workers, which in some cases remain undeclared,
- high levels of unemployment, poverty and temporary and precarious employment, whereas, in such a climate, workers are forced to give up at any insurance or any other rights,
illegal immigration because persons in such a situation are more willing to work in poor conditions, being more at risk of becoming undeclared laborers.

In Romania are numerous causes of undeclared work, so that, in our country the number of those who work ‘at black’ represent about 35% of employees, thus that, when the labor force in Romania decide to emigrate they considered as acceptable the employment in the informal sector of other countries:

- the imbalance between the demand and supply of jobs in the labor market, due to the disappearance of large industrial units or their restructuring reduced staff,
- fiscally appreciated as raised by the majority of operators in the labor market,
- the existence of underground economy,
- the fact that the vast majority of employers are adept at the policy of achieving significant short-term profits, at the expense of the company’s development strategy in the medium and long term,
- economic and financial instability of private enterprises in the SME category,
- vulnerability of large socio-professional categories resulting from the fact that they hardly find a job according to the specialized training and experience,
- low level of professional reconversion,
- low income of an important part of the working population and highly little for retirement, as well as, the pressing need supplementing them to the level of the individual acceptability,
- the large number of graduates of different forms of education looking for work, as a result of the schooling figure who do not take into account labor market demand, but are dictated either by the desire to maintain at all costs the institution of schooling, either commercial reasons,
- the sanctioning regime only for the employer, not for the employee.

The taxation reduces the marginal utility of labor, while underground economy increases it. This involves, however, a likelihood of discovery by the fiscal control authorities of undeclared work, with the eventual consequence of sanctioning by the judicial system. This risk is directly proportional to the productivity of workers in the underground economy: it is minimal for ordinary laborer who works without register its activity, a few extra hours at the weekends. Their supplementary incomes, although illegal, are usually ignored by government authorities. Instead, for example, the enterpriser who hires such laborers outside the normal work time and earn significant amounts, fiscal unregistered is an important target for the investigators. Lower risk as respects the response of state authorities explained expanding of the underground economy mainly in certain sectors and social groups.

However, it is unlikely that large companies or corporations to choose black labor, not necessarily because of numerous fiscal controllers and auditors, but especially because of the employees that will report the authorities about any infringement of their rights, any amount that will be stopped to enter in the accounts that provide support to the social security system.

Any group of government measures aimed at the underground economy, have to take into account a different aspect related to distribution of costs and benefits between those who activate in the underground. The cost of passing in underground, which includes psychological stress of the black labor, the risk of being caught by the authorities, reduced productivity as well as the actual cost of disguise activities – is particularly reduced in the case of certain categories of people, such as youth, immigrants or non-integrated social individuals because of ethnic origin or language. These persons are disadvantaged when the question arises to find a job in the official economy. Therefore, any policy that seeks to address the issue of underground economy must take into account that the measures taken will disadvantaged disproportionately the categories of persons mentioned.

From the studies made at Member State level has been found that in practice, undeclared work is manifested, among others, through the following:

- formally, employees have provided into the individual employment contract a salary which is usually the minimum wage guaranteed in payment (in this salary, employer and employee, will pay charges, taxes and contributions due to the state budget), while actually employees are paid by the employer with a greater amount than the that provided in the employment contract (informally called ‘envelope salary’),
- normal working hours is payable under the individual employment contract between the employee and the employer, while the employee overtime is paid in cash, so the amounts received by the employee for overtime are not declared and for those amounts are not paid charges, taxes and social contributions due,
- the employee performs work without an individual employment contract concluded with natural or legal person under the authority and on whose behalf work working, in which case the following aspects are
incidents: employee is deprived of the rights and benefits they would have as an employee of the person under whose authority operates; employer evade the legal obligation to record individual employment contracts to territorial labor inspectorate competent, social funds and state budget are injured by avoiding both employee and the employer to pay social security contributions,
- for the probation period does not ends individual employment contracts,
- individual employment contracts are not concludes with the persons providing services and work in individual households,
- labor force is used unlawfully day laborers and/or seasonal.

Thus, among the traditional causes of the existence of black labor lie the high levels of taxation and social contributions, as well as complicated administrative procedures to be followed in legal employment. Unjustified decrease of labor supply may be an increase to the same extent, of the underground economy. Recently, there are increasingly more tendency towards sub-contracting and false own businesses. Also, in some Member States transitional arrangements for workers in the new EU member states have exacerbated the black labor. The situation varies greatly from one Member State to another.

3. Conclusion

In Europe, the educational profile of people working legally differ significantly from that of undocumented workers, says a World Bank study. Therefore, people who have only primary education have the most probability to work in the black, but this is much more pronounced in the southern and western Europe than in the new EU member states from Central and Eastern Europe. In these countries, the majority of those employed without legal forms are high school graduates. However, in several countries, including Romania, France, Greece, Israel, Russia and the UK, between 20% and 30% of employees without legal forms have higher education. Moreover, Romania, Czech Republic, Hungary and Slovenia, a significant part of employees without legal forms works for highly skilled labor, ‘not manually’. According to an oldest survey of the European Commission, World Bank cited, most of the people working illegally in the new EU member states say that salaries are too low after fiscal requirements. In Hungary and Lithuania, around a third of respondents have passed taxes as the most important factor that encourages them to work illegally, compared to less than 10% in Slovenia, Romania, Slovakia and Bulgaria.

In Romania, the labor force without legal forms is composed almost equally of employees ‘an employer’ and independent, and most employees in black labor are working in small firms with less than 5 employees. However, Romania is among the countries with the highest rates of large firms with over 100 employees, among employers who use labor without legal forms. According to a survey conducted in 2008 among of almost 11,000 employees in 11 countries in Central-Eastern Europe 23% of respondents from Romania said they had received in the last 12 months all or part of salary in ‘envelope’, compared to 3% the Czech Republic, 5% in Slovenia, 11% or 11% in Poland. Moreover, respondents in Romania received on average 70% of salary in an envelope, much more than in the other countries concerned.

Concrete proposals of the Commission following its report about the black labor market are:
- Reduction of higher social contributions and bureaucratic procedures, principles which are laid down in the Lisbon Strategy for growth and jobs,
- member states should review traditional regulations on labor law, because they limit the mobility of workers from the new member states,
- Facilitating the exchange of good practices, systematic evaluation of policies in this field and studying continuous the black labor market situation,
- member states are invited to consider the possibility of a European platform for cooperation between labor inspectorates and other agencies,
- Active involvement of workers and employers representatives in the fight against this practice.

References


Government Spending Categories and their Different Impact on Private Consumption and the Real Exchange Rate

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Abstract
The macroeconomic literature has found puzzling effects of government spending on private consumption, the real exchange rate and the terms of trade. Some authors find that private consumption increases after a shock to government spending, while others report a decrease. The same ambiguity can be found for the real exchange rate and the terms of trade. Our paper offers an intuitive explanation for these divergent results by distinguishing between productive and unproductive government spending. We show within a calibrated two-sector DSGE model that the two government spending categories have different effects on private consumption, the real exchange rate and the terms of trade. Hence, our findings suggest that the composition of government spending matters not only for long-run growth, but also impacts on the short-run.

Keywords: Fiscal Policy, Productive Public Capital, Government Spending, Open Economy Macroeconomics

JEL Classification: E62, H31, H32, H41, F41

1. Introduction
The severe recession following the financial crisis induced many governments to initiate large fiscal stimulus programs. These measures heavily relied on increases in government spending and less on tax reductions. Policymakers particularly advocated the increase of infrastructure spending in order to stimulate GDP, investment and private consumption. It is often argued that expenditures on infrastructure have more desirable effects on these macroeconomic variables than does an increase in ordinary government expenditures.

Does an increase in government spending have different effects on the economy than a shock to unproductive government spending? Can the distinction we make between these two spending categories even help to explain the ambiguous empirical results regarding the effect of fiscal policy on the real exchange rate and the terms of trade? The real exchange rate compares domestic and foreign output prices, while the terms of trade does a similar comparison between the prices of domestic and foreign tradable goods. In the literature, there seems to be a consensus regarding the positive short-run output effect of government spending, even though there is considerable disagreement on the size of this impact (for a good overview, see Hemming, Kell and Mahfouz (2002) and Spilimbergo, Symansky and Schindler (2009)). For other macroeconomic variables such the real exchange rate, the terms of trade and private consumption, there is no consensus even on the direction of the response of these variables to an increase in government spending. Associated with these disagreements are important methodological differences in terms of the estimation strategy.

For the real exchange rate, most empirical papers report a depreciation (e.g. Corsetti, Meier and Mueller (2009) and Monacelli and Perotti (2009)), which is at odds with the theoretical predictions of the standard neoclassical model. A few find an appreciation of the real exchange rate (e.g. Clarida and Prendergast (1999)), which is, however, reversed in the longer run. The evidence for the terms of trade is also mixed: while Monacelli and Perotti (2009) report a depreciation, Mueller (2006) finds an appreciation of the terms of trade. Besides, there is no agreement as to the effects of government spending on private consumption. A range of empirical studies, e.g. Blanchard and Perotti (2002) and Monacelli and Perotti (2009) report an increase in private consumption, while other studies find a negative effect (see e.g. Ramey and Shapiro (1999), Edelberg, Eichenbaum and Fisher (1999) and Ramey (2008)).

The views expressed are those of the author and not necessarily those of the affiliated institution.
Our purpose in this paper is to investigate whether the puzzling empirical findings regarding the effects of government spending can be explained by distinguishing between productive and unproductive government spending. This is done by adding the stock of public capital to the production function of private firms. We study the effects of productive government spending in a small open two-sector economy. By distinguishing between a trading and a non-trading sector, we get useful insights into the different reactions of the real exchange rate and the terms of trade.

The general idea behind including productive government spending in the production function is that public and private inputs are not close substitutes. Examples of productivity enhancing government spending include - in a narrow sense - roads, railway infrastructure and airports. In a broader sense, one could also include spending categories such as education and health care. In this paper, however, we interpret productive public capital in a narrow sense to get a conservative idea of its theoretical short-run effects. An early theoretical contribution to the analysis of public infrastructure in the context of long-run economic growth stems from Arrow and Kurz (1969). The literature was further developed by Barro (1990) and Baxter and King (1993). The more recent literature includes, among others, Linnemann and Schabert (2006) and Leeper, Walker and Yang (2009), who analyze a closed economy. Empirically, an early influential study was conducted by Aschauer (1989), who estimated a log-linear production function and found an elasticity of 0.39 of output to nonmilitary public infrastructure. However, this high initial estimate of the productivity of public infrastructure was revised downwards by subsequent research and sometimes even estimated to be 0 (for a survey of the literature, see Romp and de Haan (2007)). A reasonable range for the elasticity seems to lie between 0.1 and 0.2.

If one adds the stock of public capital into the production function, what does standard macroeconomic theory predict will happen in the short-run after a shock to government investment? First, an increase in government demand for investment goods has the same effect on demand as a shock to non-productive spending. There is, however, an additional effect here, namely that government investment increases the productivity of private firms. This part of the impact of a shock to productive government spending should thus show similar effects as a technology shock, whose impacts have been studied extensively in the macroeconomic literature. A shock to productive government spending is therefore a combination of these two partial effects. While both kind of shocks can be expected to increase GDP, things are more complicated for private consumption. Consumption increases after a technology shock, but decreases after a shock to unproductive government spending. The same ambiguity holds for private investment and the terms of trade. While a technology shock increases private investment and depreciates the terms of trade, the opposite holds for the demand shock, as it was discussed for unproductive government spending.

The remaining part of this paper is organized as follows. In section 2, we describe the model of a small open economy that is used to simulate the macroeconomic effects of fiscal policy instruments. This description is followed by section 3, which explains how the parameter values of the model are chosen. The simulation results of this model are presented and discussed in section 4. Finally, section 5 contains the conclusion.

2. The Model

The model used to analyze the macroeconomic effects of government spending categories is an extension of a standard DSGE model. The special features of the model in this paper are that it incorporates a detailed analysis of the government and two sectors of production. We call the first sector the manufacturing sector that produces tradable goods. The second sector is called the services sector comprising e.g. the majority of services, construction work and agriculture. The goods produced in the services sector are assumed to be non-tradable. Both sectors employ labor and capital, which makes it possible to study the sector specific behavior of the variables in these two sectors.

2.1. Production

2.1.1. Sector ‘M’

In this sector that can be interpreted as the manufacturing sector, the perfectly competitive firms produce output \( m \), according to:

\[ m = z^m (k^m)^{\alpha} (l^m)^{1-\alpha} \]

(1)

Note that a subscript to identify an individual firm is suppressed because all firms are identical. \( k^m \) is
capital used in this production sector and \( l^m_t \) is labor input. \( k^g_t \) is the stock of public capital, which is assumed to be non-rival. This means that public infrastructure is equally productive for all firms. \( \alpha_1 \) and \( \gamma \) determine the elasticity of output with respect to the input factors. \( z^m_t \) stands for total factor productivity. Note that there are constant returns to scale in the privately provided inputs. One could also assume constant returns to scale in all three inputs, as it was done by Aschauer (1989) and Barro (1990). In fact, as pointed out by Turnovsky and Fisher (1995), it makes little difference to the result what specification is actually chosen, provided that one assumes \( F_{kl} > 0 \), which is given for the chosen production function. The solution to the cost minimization problem implies that all intermediate goods firms equate their capital-labor ratio to a constant determined by \( \alpha_1 \) times the ratio of nominal input prices, which are given by \( w^m_t \) for labor and \( r^m_t \) for capital.

\[
\frac{k^m_t}{l^m_t} = \frac{1 - \alpha_1 \frac{w^m_t}{r^m_t}}{\alpha_1}
\]

(2)

To keep the basic version of the model as simple as possible, prices are assumed to be flexible. Output prices \( p^m_t \), which are equal to nominal marginal costs are then given by:

\[
 p^m_t = mc_t^m = \frac{(r^m_t)^{\alpha_1} \left( w^m_t \right)^{1-\alpha_1} (1-\alpha_1)^{\alpha_1-1} \alpha_1^{-\alpha_1}}{(k^g_t)^{\gamma}}
\]

(3)

From this expression, one can see that an increase in productive public capital has the same effects on output prices as a technology shock.

2.1.2. Sector ‘S’

This sector can be seen as comprising the services and the construction sector. Production in this relatively unproductive sector is given by:

\[
s_t = z^s(k^g_t)^{\alpha_2} (k^s_t)^{\gamma_2} (l^s_t)^{1-\alpha_2}
\]

(4)

\( k^s_t \) is capital and \( l^s_t \) is labor used in the inefficient sector. As for the manufacturing sector, \( k^g_t \) denotes the stock of productive public capital and is again assumed to be non-rival. \( \alpha_2 \) and \( \gamma \) determine the elasticity of output with respect to the input factors and \( z^s \) denotes total factor productivity. It is assumed that \( \alpha_1 > \alpha_2 \), which implies that the services sector is more labor intensive than the manufacturing sector. Cost minimization implies for nominal output prices and marginal costs:

\[
p^s_t = mc_t^s = \frac{(r^s_t)^{\alpha_2} \left( w^s_t \right)^{1-\alpha_2} (1-\alpha_2)^{\alpha_2-1} \alpha_2^{-\alpha_2}}{(k^g_t)^{\gamma}}
\]

(5)

In addition, the optimal ratio between capital and labor is given by:

\[
\frac{k^s_t}{l^s_t} = \frac{1 - \alpha_2 \frac{w^s_t}{r^s_t}}{\alpha_2}
\]

(6)

2.1.3. Investment

In the preceding sections, we did not discuss the evolution of the capital stock. The inclusion of two production sectors into the model raises the issue of the composition of investment expenditures. According to

\footnote{In the appendix, a version of the model with sticky prices is discussed.}
Empirical evidence, investment can be seen as a composite of manufacturing and services goods (see e.g. Bems (2008). Following this reasoning, investment in the two sectors can be described by a CES-type function:

\[ im_t = \left( \frac{1}{\alpha_1} \left( \frac{1}{\alpha_1} \right)^{\alpha_1} + (1 - \alpha_1) \left( \frac{1}{\alpha_1} \right)^{\alpha_1} \right)^{\alpha_1} \]  

\[ is_t = \left( \frac{1}{\alpha_2} \left( \frac{1}{\alpha_2} \right)^{\alpha_2} + (1 - \alpha_2) \left( \frac{1}{\alpha_2} \right)^{\alpha_2} \right)^{\alpha_2} \]  

\( im_t \) and \( is_t \) denote demand for investment goods by the two sectors and a superscript \( m \) or \( s \) tells us the demand for goods produced by sector \( m \) and \( s \). \( \theta_1 \) and \( \theta_2 \) determine the elasticity's of substitutions between the two inputs. Concerning \( \alpha_1 \) and \( \alpha_2 \), we will assume that investment expenditures in a sector are biased towards goods from its own sector.

It is straightforward to derive the associated price indexes \( p_{im}^{im} \) for \( im_t \) and \( p_{is}^{is} \) for \( is_t \):

\[ p_{im}^{im} = \frac{a_1 p_m^m}{p_{im}^{im}} \]  

\[ p_{is}^{is} = \frac{a_2 p_s^s}{p_{is}^{is}} \]  

The input demand functions can be written as:

\[ im_t^m = a_1 \left( \frac{p_m^m}{p_{im}^{im}} \right)^{\alpha_1} \]  

\[ im_t^s = (1 - \alpha_1) \left( \frac{p_s^s}{p_{im}^{im}} \right)^{\alpha_1} \]  

\[ is_t^m = a_2 \left( \frac{p_m^m}{p_{is}^{is}} \right)^{\alpha_2} \]  

\[ is_t^s = (1 - \alpha_2) \left( \frac{p_s^s}{p_{is}^{is}} \right)^{\alpha_2} \]  

Finally, the evolution of the two capital stocks, which is driven by investment, can be written as:

\[ k_{m+1}^m = (1 - \delta) k_{m}^m + im_t \]  

\[ k_{s+1}^s = (1 - \delta) k_{s}^s + is_t \]  

As usual, the parameter \( \delta \) is the rate of depreciation, which is assumed to be the same in both sectors.
2.2. The Representative Individual

The economy in this model is populated by a representative individual, whose utility function $U$ is given by:

$$ U = E \sum_{t=0}^{\infty} \beta^t \left( c_t^{1-\sigma} - \frac{1}{1 - \sigma} \left( \phi_1 (l_t^m)^{1+\sigma} + \phi_2 (l_t^s)^{1+\sigma} \right) \right) $$

(9)

$c_t$ is a consumption aggregate, $l_t^m$ denotes hours worked in the more productive sector and $l_t^s$ is hours worked in the less productive sector. $\sigma$ is a parameter that determines the inter-temporal substitution of consumption. $\chi$ is a parameter that determines the inverse of the Frisch elasticity of labor supply and the parameters $\phi_1$ and $\phi_2$ influence the disutility of work. This disutility is assumed to be higher for the productive sector, because work in this sector is supposed to be more stressful.

Given that the representative individual is the owner of the capital stocks described in the last section, she has to make investment decisions. Besides, the individual holds one-period government bonds $(d_t)$ and pays lump-sum taxes. Following this description, the budget constraint can be written in nominal terms:

$$ (w_t^m l_t^m + w_t^i l_t^i) + r_t^m k_t^m + r_t^s k_t^s = p_t^c c_t + p_t^{im} m_t + p_t^{is} s_t $$

$$ -(1+r_t^d) d_{t-1} + d_t + (1+r_t^f) f_{t-1} - f_t + \frac{\chi}{2} (f_t - f_{t-1})^2 $$

(10)

$p_t^c$ is the price for the consumption aggregate, i.e. the consumer price index (CPI). $r_t^d$ is the nominal interest rate on this debt. The term $\frac{\chi}{2} (f_t - f_{t-1})^2$ stands for adjustment costs that a consumer has to pay when he changes his holdings of foreign debt. These costs are small and are solely included to make the model stationary (see Schmitt-Grohe and Uribe (2003)). The evolution of $f_t$ is given by

$$ f_t = -tb_t + (1+r_t^f) f_{t-1}, $$

where $tb_t$ is the nominal trade balance given by: $tb_t = p_t^m ex_t - p_t^{im} c_t^{imp}$. In steady-state, exports equal imports for each category of goods, which implies that the trade balance is zero. Exports are modeled in a way such that a one-percent increase in domestic prices leads to a one-percent decrease in exports. Note further that this paper considers a cashless economy and, therefore, consumers hold no money. The first-order conditions for the individual are given by:

$$ c_t^{-\sigma} p_t^{im} = \beta c_t^{-(\sigma+1)} \left( 1 - \delta \frac{p_t^{im}}{p_t^{es}} + \frac{r_t^m}{p_t^{es}} \right) $$

(11)

$$ \beta c_t^{-\sigma} \left( p_t^{is} \right) = c_t^{-\sigma} \left( \frac{p_t^{is}}{p_t^c} \right) $$

$$ \beta c_t^{-\sigma} \left( 1 - \delta \frac{p_t^{im}}{p_t^{es}} + \frac{r_t^s}{p_t^{es}} \right) $$

(12)
\[
\frac{c_{t-1}^{\sigma}}{p_t^c} = \beta \frac{c_{t+1}^{\sigma}}{p_{t+1}^c} (1 + r_d^t) \\
\psi_1 p_t^c (l_t^m)^x = w_t^m c_t^{\sigma} \\
\psi_2 p_t^c (l_t^s)^x = w_t^s c_t^{\sigma}
\]

(13)  
(14)  
(15)

The consumption aggregate \( c_t \) consists of tradable manufacturing goods \( c_t^{tr} \) and services \( c_t^s \):

\[
c_t = \left[ \frac{1}{\alpha_3} (c_t^{tr})^{\alpha_3-1} + (1 - \alpha_3) \frac{1}{\alpha_5} (c_t^s)^{\alpha_5-1} \right]^{\frac{1}{\alpha_3}}
\]

(16)

\( \alpha_3 \) is a weighting parameter that influences the expenditure shares of private consumption that go to the two sectors and \( \theta_3 \) determines the elasticity of substitution between the two types of consumption. The associated demand functions are:

\[
c_t^{tr} = \alpha_3 \left( \frac{p_t^{tr}}{p_t^c} \right)^{-\theta_3} c_t
\]

\[
c_t^s = (1 - \alpha_3) \left( \frac{p_t^s}{p_t^c} \right)^{-\theta_3} c_t
\]

The consumer price index (CPI) for the consumption aggregate is given by:

\[
p_t^c = \left( \alpha_3 (p_t^{tr})^{-\theta_3} + (1 - \alpha_3) (p_t^s)^{-\theta_3} \right)^{\frac{1}{\theta_3}}
\]

(17)  
(18)

Within the category of tradables \( (c_t^{tr}) \), the individual can choose between consuming domestically produced final manufactured goods \( (c_t^m) \) and an equivalent imported final good \( (c_t^{imp}) \):

\[
c_t^m = \alpha_4 \left( \frac{p_t^m}{p_t^{tr}} \right)^{-\theta_4} c_t^{tr}
\]

(19)

\[
c_t^{imp} = (1 - \alpha_4) \left( \frac{p_t^{imp}}{p_t^c} \right)^{-\theta_4} c_t
\]

The associated price index for tradable consumer goods is given by:

\[
p_t^{tr} = \left( (1 - \alpha_4) (p_t^{imp})^{-\theta_4} + \alpha_4 (p_t^m)^{-\theta_4} \right)^{\frac{1}{\theta_4}}
\]

2.3. The Government

In this section, fiscal policy is studied in a detailed manner and takes more space than in other papers. We assume that the government collects lump-sum taxes that are used to finance productive government spending \( (\tilde{g}_t) \), and to pay the government’s non-productive expenditures \( (g_t) \), which includes payments to government
employees and the consumption of goods and services. Thus, the government has the following budget constraint in nominal terms:

$$d_t + t_t = p_t^i g_t + p_t^s g_t + (1 + r_{t-1}^d) d_{t-1}$$

It is assumed that the government buys its goods and services from the private sector. This incorporates the assumption that the production function of the government is the same as the production function of the private sector. More specifically, it is assumed that the government buys its goods from sector S. Given that sector S is meant to comprise services and construction work, this assumption can be seen as reasonable.

Since our objective is to study the effects of productive and unproductive government spending, two separate policy rules for these two spending instruments are set up. Formally, the rules for real productive and unproductive government spending are assumed to be given by:

$$\frac{p_t^i g_t}{p_t^i} = \left( \frac{p_{t-1}^i g_{t-1}}{p_{t-1}^i} \right)^{q_1} \left( \frac{p_{t-1}^s g_{t-1}}{p_{t-1}^s} \right)^{1-q_1} e^{e_3}$$

$$\frac{p_t^s g_t}{p_t^i} = \left( \frac{p_{t-1}^i g_{t-1}}{p_{t-1}^i} \right)^{q_2} \left( \frac{p_{t-1}^s g_{t-1}}{p_{t-1}^s} \right)^{1-q_2} e^{e_4}$$

Where: \(q_1\) are parameters that measure the elasticity of the left-hand side variable with respect to the right-hand side variable. The subscript \(ss\) denotes steady-state values and \(e_t\) are shocks to the two governments spending categories.

In this model, government expenditures are initially financed by public debt. To ensure that the model eventually returns to its steady-state, it is usually necessary that a fiscal variable reacts to the debt-to-GDP ratio (see e.g. Leeper et al. (2009)), where real GDP is given by \(gdp_t = \frac{p_t^i m_t + p_t^s s_t}{p_t^i}\). In our model, lump-sum taxes react to the debt-to-GDP ratio. This leads to a rule for real taxes similar to the one for the two spending categories without the shock term, but augmented with a term that reflects the reaction to the debt-to-GDP ratio:

$$\frac{t_t}{p_t^i} = \left( \frac{t_{t-1}}{p_{t-1}^i} \right)^{q_3} \left( \frac{t_{ss}}{p_{ss}^i} \right)^{1-q_3} \left( \frac{d_{t-1}/p_t^i gdp_{t-1}}{d_{ss}/p_{ss}^i gdp_{ss}} \right)^{q_4}$$

These government spending rules should not be interpreted as institutional rules restricting the government. Instead, one should see them as a description of fiscal policy (decided by a government that takes into account the evolution of public debt into account). Alternatively, one could assume that fiscal policy instruments relative to GDP are the variables of interest. However, at least in the short-run, it is unlikely that policy-makers target ratios of fiscal variables to GDP. Finally, the evolution of public capital is given by:\(^3\)

$$k_{t+1}^g = ig_t + (1-\delta)k_t^g$$

Note that the rate of depreciation for public capital is assumed to be the same as for the private sector.

### 2.4. Resource Constraints

To close the model, the resource constraints need to be satisfied.

$$s_t = c_t^i + im_t^i + is_t^x + ig_t + g_t$$

---

\(^3\) In the appendix, the effects of longer implementation delays are discussed
\begin{equation}
m_t = c_t^m + ex_t^m + im_t^m + is_t^m
\end{equation}

(25)

3. Choice of Parameter Values

The chosen parameter values of the model are listed in Table 1. As it is common in the literature, one period in the model corresponds to one quarter. Most parameters lie in the range of most papers in the DSGE literature on fiscal policy. The discount factor is set to 0.99. The coefficients that determine the inter-temporal substitution of consumption and the inverse of the Frisch elasticity of labor supply are both equal to 1.

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<tr>
<td>$q_1$</td>
<td>0.85</td>
<td>$\theta_4$</td>
<td>1</td>
</tr>
</tbody>
</table>

$\alpha_1$ is assumed to be bigger than $\alpha_2$, which implies that the share of capital in the manufacturing sector is bigger than in the services sector. We experiment with two values of $\gamma$, 0.1 and 0.2, which implies that a one percent increase in $k^z$ rises output by 0.1\% resp. 0.2\%. As has been discussed in section 1, these values correspond to a reasonable lower and upper bound of the empirical findings in the long-run growth literature. The parameters that determine the elasticities of substitution between consumption aggregates are set to 1, which implies that a constant share of a spending aggregate goes to the respective spending category. $a_1, a_2, a_3, a_4, \theta_1, \theta_2, \theta_3, \theta_4$ are all chosen in a way to reflect the assumed biases discussed in section 2. In steady-state, the price of manufacturing output relative to the price of services is assumed to be equal to 1.

We calibrate fiscal policy in a similar way as in Davig and Leeper (2009). The size of government (excluding transfers), measured as the ratio of total expenditures to GDP is set to approximately 0.20. The steady-state ratio of productive government spending to GDP is roughly 0.04, and for non-productive government spending 0.15. Lump-sum taxes are chosen in a way such that the debt-to-(quarterly)GDP ratio is near 2.4. Since the variables are calibrated at a quarterly frequency, this implies a debt-to-(annual)-GDP ratio of roughly 0.6. This corresponds roughly to the average debt-to-GDP ratio for OECD countries before the financial crisis. The values of the parameters $q_1$ and $q_2$ are inspired by Corsetti et al. (2009) and both set to 0.85. As discussed in section 2, the parameter $\zeta$ determines the adjustment costs of foreign debt.

4. Simulation Results

In this subsection, we present impulse response functions for shocks to productive (reig) and unproductive
We focus on the variables real GDP (gdp), real consumption (cons), real wages in the manufacturing (wage_m) and the services (wage_s) sector, the real interest rates in both these sectors (int_m and int_s), the relative price of manufacturing output relative to services (pm_ps), the real exchange rate (rex) and the terms of trade (tot).

4.1. Shock to Unproductive Government Spending

This section looks at the behavior of the model after a shock to unproductive government spending. As one can see in figure 1, the reaction of the variables corresponds to the theoretical predictions of a standard macroeconomic model. There is a positive effect on GDP, which, however, disappears within roughly ten periods. As expected, the consumption aggregate decreases. Given that unproductive government spending goes to the services sector, it is not surprising that real wages in this relatively unproductive sector increase, while real wages in the productive sector decrease. The same development can be observed for the real interest rates in the two sectors.

Concerning the real interest rate and the terms of trade, one can see that the real exchange rate appreciates because domestic output prices increase including the prices for tradables. The terms of trade initially depreciate before they appreciate. Why is this case? This is due to the fact that higher unproductive government spending increases prices in the non-tradable sector, which therefore leads to a substitution of private consumption and investment towards the tradable good.

**Figure 1. Shock to Unproductive Government Spending**

---

4 For all simulations, the Dynare software version 4.2 is used.

5 Formally, the real exchange rate is defined as $rex_t = (p_t^m)/(p_t^c)$ and $tot_t = (p_t^m)/(p_t^m)$.
4.2. Shock to Productive Government Spending

The impulse response functions for a shock to productive government spending (figure 2) confirm the theoretical reasoning applied in section 1, namely that this shock can be seen as a combination of a technology shock and a nonproductive government spending shock. There is a persistent increase in GDP due to the productivity-enhancing effect of productive government spending. Consumption initially decreases, but becomes positive as soon as the productivity-enhancing part of the shock dominates the pure government demand shock. Real wages and interest rates show a divergent pattern in the short-run due to the demand side effect of government spending. After some periods, however, the increase in productivity dominates and leads to an increase in real income for factor inputs in both sectors. Compared with a shock to unproductive spending, it is in particular the real wage in the services sector, whose evolution changes and remains above its steady-state level. One can observe that the response of private consumption becomes positive roughly at the same time as the response of real wages in both sectors turns positive. Real interest rates show a pattern similar to that of real wages.

The real exchange rate appreciates in the short-run because increased government demand leads to a rise in the consumer price index. As soon as the productivity-enhancing effect dominates, the real exchange rate depreciates. The terms of trade, however, increase (i.e. depreciate) immediately because of the assumption that government demand goes to the non-tradable sector, while increasing productivity in both the tradable and non-tradable sector.

Figure 2. Shock to Productive Government Spending when $\gamma = 0.1$
If one does the same exercise using a value of $\gamma = 0.2$, the observed effects can be expected to become more pronounced. Indeed, this is what can be seen from the impulse responses in figure 3. Interestingly, the responses of private consumption and the real exchange rate are now already positive in the first periods.

**Figure 3. Shock to Productive Government Spending when $\gamma = 0.2$**

5. Conclusion
In this paper, we have compared the short-run effects of productive and unproductive government spending on private consumption, the real exchange rate and the terms of trade. The simulation results show that the distinction between these two spending categories can contribute to explain why the empirical literature has found divergent impacts of government spending on these two macroeconomic variables.

The distinction between productive and unproductive government spending is somehow artificial and it is often difficult to make in practice. Furthermore, policymakers may be incited to declare a stimulus package as productivity enhancing when in reality, it is not. While the model in this paper has contributed to the theoretical basis to judge the potential impact of productive government spending, the practical relevance of these findings need to be examined by future research.

**References**


Implementation Delays

This section of the appendix considers the effects of implementation delays associated with building public capital. This modification tries to take into account that the provision of productive government spending may take more than one period (as in e.g. Leeper et al. (2009)). Thus, we vary $n$ in the equation

$$k_{t+1}^n = ig_{t-n} + (1 - \delta)k_t^n.$$

Figure 4 shows how implementation delays affect the impulse responses for our economy. We consider three cases to illustrate the effects of varying $n$: $n = 0$ as in the main part of this paper (solid lines), $n = 2$ (dashed lines) and $n = 4$ (dotted lines). The impulse response functions for the first 15 periods after the shock are depicted.

One can see that the qualitative pattern of most of the impulse response functions does not change. If there are implementation delays, the response of GDP is first very similar to the response for a shock to unproductive government spending. Due to this reason, the response of GDP even becomes negative after some periods when there are implementation delays. One can further observe that the effects on the terms of trade and the real exchange rate are only slightly modified.

**Figure 4.** Shock to Productive Government Spending with Implementation Delays: $n = 0$ (solid lines), $n = 2$ (dashed lines) and $n = 4$ (dotted lines)

Announcement Shocks

While implementation delays in a technological sense were analyzed in the last section, this section looks at implementation delays associated with the political and administrative process. What is meant by this is the period of time between the announcement of a project and its actual starting point. Thus, public investment $ig_t$ at period $t$ is determined by the announcement $j_{t-n}$ of future investment by the government at period $t - n$. We thus have $ig_t = j_{t-n}$, which shows that we do not consider uncertainty about the completion of a project due to the political
process. As in the last section, we consider three cases to illustrate the impacts of varying \( n : n = 0 \) (solid lines), \( n = 2 \) (dashed lines) and \( n = 4 \) (dotted lines).

One can observe in figure 5 that the response of GDP already differs in the first period, where the unexpected government demand shock immediately stimulates the economy for the case \( n = 0 \). Pure announcement shocks make individuals smooth their consumption. In the case of a delay between the announcement of a project and its provision, consumption falls less initially, but then increases less for the rest of the periods. Hence, we can observe an attenuation effect. An attenuation effect can also be observed for GDP. The longer the delay, the less pronounced is the increase in GDP when a project is actually realized.

**Figure 5.** Announcement Shock of an Increase of Productive Government Spending: \( n = 0 \) (solid lines), \( n = 2 \) (dashed lines) and \( n = 4 \) (dotted lines)

The Effects of Sticky Prices

In this section, we analyze a version of the model that incorporates sticky prices. The modeling of sticky prices follows the formalism proposed by Calvo (1983) and explained in detail in e.g. Gali (2008). In this environment, there is a continuum of firms of measure 1 that produce intermediate products. Firm \( i \) produces \( \pi^m(i) \) in sector \( M \) and \( \pi^s(i) \) in sector \( S \). A bundler firm puts the intermediate products together in order to provide the final good that can be used for consumption and investment. In each period, an individual firm can reset its price with probability \( 1 - \mu \). When a firm can optimize its output price, it will take into account that it may not be able to repotimize this price in the future. Each firm maximizes the present value of profits weighting future profits by the probability that the price chosen now still applies in the future. Each firm in sector \( M \) and sector \( S \) will then choose their optimal prices \( p^m_t \) and \( p^s_t \) by solving the following maximization problems:
\[ m_t(i) = \left( \frac{p_i^{m0}}{p_i^{m}} \right)^{-\nu} m_t \]

and

\[
\max_{p_i^{so}} \sum_{t=0}^{\infty} \beta^t \mu^t E_t \left\{ p_t^{so} s_t(i) - mc_t^s s_t(i) \right\}
\]

subject to:

\[ s_t(i) = \left( \frac{p_i^{so}}{p_i^s} \right)^{-\nu} s_t \]

The optimal prices are then given by:

\[
p_t^{mo} = \frac{\nu}{\nu - 1} \left( \frac{mc_0^m m_0^m(p_0^m)^\nu + \sum_{t=1}^{\infty} \mu^t \beta^t m_t mc_t^m (p_t^m)^\nu}{m_0(p_0^m)^\nu + \sum_{t=1}^{\infty} \mu^t \beta^t m_t (p_t^m)^\nu} \right)
\]

\[
p_t^{so} = \frac{\nu}{\nu - 1} \left( \frac{mc_0^s s_0^s(p_0^s)^\nu + \sum_{t=1}^{\infty} \mu^t \beta^t s_t mc_t^s (p_t^s)^\nu}{s_0(p_0^s)^\nu + \sum_{t=1}^{\infty} \mu^t \beta^t s_t (p_t^s)^\nu} \right)
\]

These two expression can be written in recursive forms that can then be embedded into our DSGE model. For sector \( M \), we have:

\[
x_t^m = m_t(p_t^m)^\nu mc_t^m + \beta \mu x_{t+1}^m
\]

\[
y_t^m = m_t(p_t^m)^\nu + \beta \mu y_{t+1}^m
\]

\[
p_t^{mo} = \frac{\nu}{\nu - 1} \frac{x_t^m}{y_t^m}
\]

Where: \( x_t^m \) and \( y_t^m \) are two auxiliary variables. Similarly, we have for sector \( S \):

\[
x_t^s = s_t(p_t^s)^\nu mc_t^s + \beta \mu x_{t+1}^s
\]

\[
y_t^s = s_t(p_t^s)^\nu + \beta \mu y_{t+1}^s
\]

\[
p_t^{so} = \frac{\nu}{\nu - 1} \frac{x_t^s}{y_t^s}
\]

Every firm that can choose an optimal price in period \( t \) chooses the same optimal price. Hence, the aggregate price indices evolve as follows:

\[
p_t^m = \left( \mu(p_{t-1}^m)^{1-\nu} + (1- \mu)(p_t^{mo})^{1-\nu} \right)^\frac{1}{1-\nu}
\]

\[
p_t^s = \left( \mu(p_{t-1}^s)^{1-\nu} + (1- \mu)(p_t^{so})^{1-\nu} \right)^\frac{1}{1-\nu}
\]

Because of the markup over marginal costs, firms now make aggregate profits

\[
\Pi_t^m = p_t^m m_t - w_t^m l_t^m - r_t^m k_t^m
\]

and
\[ \Pi'_t = p'_is_t - w'_it'_l_t - r'_ie_t', \]

which are equally distributed among the individuals. Adding these profit shares to the budget constraint for an individual gives:

\[
(w'_im'_l + w'_im'_l) + \left( r'_im'_k + r'_ie_t' \right) + (1 + r'_iei) d_{t-1} + \Pi'_t =
\]

\[
p'_ic_i + p'_im'_m + p'_is_i + d_i + p'_i \frac{K}{2} \left( k_{t-1}^{m} - k_{t}^{m} \right)^2 + \left( k_{t-1}^{e} - k_{t}^{e} \right)^2 \right) + t_i
\]

(26)

We have used two new parameters in this extension of the model, which need to be calibrated. For \( \nu \), we choose a value of 10 which is within the range of values usually used for this parameter. For \( \mu \), we consider three different cases that are depicted in figures 6: one where \( \mu = 0.25 \) (solid lines), one case with \( \mu = 0.50 \) (dashed lines) and one case with \( \mu = 0.75 \) (dotted lines).

The attenuation effect of sticky prices on the consumer price index (see figure 6) leads to a less pronounced impact on the real exchange rate and the terms of trade. Sticky prices in the tradable goods sector \( M \) prevent a strong immediate decrease of output prices in this sector. In all cases, foreign demand drives prices up and leads to a more negative impact on private consumption.

**Figure 6.** Shock to Productive Government Spending under Sticky Prices: \( \mu = 0.25 \) (solid lines); \( \mu = 0.5 \) (dashed lines); \( \mu = 0.75 \) (dotted lines)
Competitiveness and Determinants of Coffee Exports, Producer Price and Production for Ethiopia

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Abstract
This study analyzed the performance and determinants of coffee exports, producer price and production for Ethiopia. The Revealed Comparative Advantage and Revealed Symmetric Comparative Advantage measures of competitiveness used for the performance analysis show that even though Ethiopia has comparative advantage in export of coffee, the same cannot be said of its overall performance on the international market owing to challenges with management of price risk, high transaction cost resulting from the extensive nature of the supply chain and the numerous actors and processes therein, challenges with quality control, low productivity of growers’ fields, and incidence of smuggling. To improve upon its export performance and ensure continuous growth in its exports, prices and production, we propose investment in yield-enhancing innovations, devising and implementation of measures to improve quality control in the supply chain, address issues with price risk, minimize incidence of smuggling, minimize transaction costs, increase and ensure continuous government support to the subsector, hold onto the current devaluation of the Ethiopian birr, ensure payment of fair prices to growers and appropriately transmit future increments, increase current area under cultivation to enhance efficient utilization of the abundant labor, and to attract more export-oriented foreign direct investments (to enhance trade creation).

Keywords: competitiveness, supply chain, determinants, export, producer price, production

JEL Classification: Q1, Q11, Q13, Q17, Q18

1. Introduction
The coffee subsector of Ethiopia has been and continues to be the foundation for the country’s agricultural and economic development. The importance of the subsector in the country and the world market cannot be overemphasized. For instance, the subsector accounts not only for over 35% of agricultural foreign exchange earnings and about 4% of agricultural Gross Domestic Product, it also provides income to over 15 million people in the country (Ministry of Trade 2012) through provision of jobs for farmers, local traders, processors, transporters, exporters and bankers. Through various taxes levied on the crop, it also serves as an important source of government revenue (ICO/CFC 2000). In addition to these, coffee green exports from Ethiopia accounted for approximately 3.31% in value of world coffee green exports between the years 2001 and 2010. In spite of flaws in past policy measures devised and implemented in the country, Ethiopia still holds much respect in the global coffee market. As to whether she can stand the test of time given anticipated increases in world price of agricultural export commodities (including cocoa and coffee) over the next decade (World Bank 2007) and the accompanying intensification of competition on the supply-side with emergence of new producers and exporters of coffee is yet to be ascertained. To help mitigate any adverse future influences from competition on the world coffee market (that could preclude achievement of national development goals, including but not limited to income generation and poverty reduction) and ensure effective and efficient participation and contribution of the country to world coffee green production and exports, there exists a strong case to assess its past and current performance in export of the commodity and to identify and estimate the magnitude and effects of key economic determinants on the major strongholds of the subsector namely exports, price and production. To help inform future policy prescriptions, the current study is focused on addressing these issues.

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2. Evolution of Policy on Coffee and Government Assistance

Policies on coffee in Ethiopia may be looked at under three different forms of government; imperial government (until 1974), military rule with Marxist ideological orientation from 1974 – 1991 and a federal (reformist government) governance system from 1991 onwards (ICO/CFC 2000).

Under the imperial government, the marketing structure for coffee was free market-based, with the industry being regulated by the National Coffee Board of Ethiopia. During this period, coffee was bought by traders at various stages of the supply chain and exported, with relatively minimal quantities of the crop been auctioned by traders at voluntary auctions in Dire Dawa and Addis Ababa (ICO/CFC 2000). The role of National Coffee Board of Ethiopia was limited to regulation of the auction process and quality control. The free market-based system lasted until 1974, from whence it was replaced by a system with heavy State involvement.

After the revolution in 1974, the former National Coffee Board of Ethiopia was replaced by the Ministry of Coffee and Tea Development (MCTD), and coffee production and marketing became heavily controlled by the state. In as much as private traders were still given permit to engage in purchases of the crop, much purchase was handled by the state-owned Ethiopian Coffee Marketing Corporation (ECMC), established in 1977. Activities of private traders were constrained by licensing requirements, fees and taxes. The ECMC, was reportedly responsible for handling 90% of supplies (ICO/CFC 2000), and producers had limited flexibility in terms of the time and price for selling their produce (as prices were fixed). Under this regime, Ethiopian agricultural policy was centrally planned and controlled by a system of quotas and price fixing. All coffee, handled either by the ECMC or private traders had to go to auction where the price fixing and quota system apportioned ECMC with all the washed coffee, and the largest quota for unwashed coffee, thereby limiting competition between private and public buyers. During this period, grower prices were set by the MCTD, with the difference between the grower price and export (FOB) price less marketing costs taken by the government. With the less competitive marketing environment of the country and decline in world prices (during this period) following the collapse of the International Coffee Agreement quotas, a drastic decline in production and exports from the country was experienced. In spite of the dark image portrayed about this regime, it did place much emphasis on quality of Ethiopian coffee exports than the preceding regime precisely because both washed and unwashed coffees were subject to a number of inspections and quality controls throughout the marketing chain.

Control of the State over coffee production and marketing was once again minimized through partial liberalization of internal marketing in 1993. Since 1991, there has been a transformation from a centrally planned economy to a market-oriented economy. This was a result of the replacement of the military government (Dirge regime) by a democratic regime, thereby bringing all Marxist economic policies and ideas to a halt. Liberalization of the coffee subsector was purposed on promoting production and reducing incidence of smuggling through the increase in grower prices. In contrast to the fixed price set under the Dirge regime, payment to farmers in the reform period was determined by the market although government continued to set a floor price until 1997 above which prices offered to growers at times rose. This reform brought many new exporters and intermediaries into the sector, and the proportion of coffee handled internally by private traders was increased to 85% of deliveries at the auction while the number of licensed private exporters also increased from 14 to 240 (with approximately 75 being active by the year 1999), (ICO/CFC, 2000). Following initiation of the reform in 1991, the ECMC was split into two public enterprises namely the Ethiopian Coffee Purchase and Sales Enterprise (ECPSE) and the Ethiopian Coffee Export Enterprise (ECEE). The ECPSE purchases coffee internally and delivers it to the auction, and the ECEE purchases coffee from the auction and exports it. As a means of enhancing competitiveness of the subsector, licensing fees have been lowered, the quota system at the auctions has been abolished, private traders are allowed to trade in washed coffees, and wholesalers (Akrabies) and exporters are allowed to sell coffee domestically at market prices, instead of through parastatals. In addition, Cooperative Unions have been given permit to engage in direct sales and export (Dempsey and Campbell, undated) since the year 2001. As of the year 2012, more than 120 Ethiopian coffee exporters participated in processing and export of coffee to various destinations. Of these export companies, 95% were private companies, 5 coffee growing farmers’ cooperative unions and 2 government enterprises (Ministry of Trade 2012).

With increased competition and lower taxation of farm income from sales of coffee, grower prices as a proportion of the export price has increased. By figures reported by Anderson and Nelgen (2012), farm taxation fell markedly from 42.78% in 1992 to 2.99% in the year 2008. This rate compares favorably with that of other major exporting countries like Indonesia (11.09% by 2008) and Nicaragua (64.01% by 2008), but above that for Colombia (1.41% by 2008). The reduction in farm taxation has contributed greatly to increased coffee green outputs in the country since the year 2005. Increased private participation also helped raise coffee supply to auction markets from 60,000 tons in 1991 to 221,000 tons in 2005/2006 (Worako et al. 2008). In spite of these improvements however, the post-reform marketing system in Ethiopia is criticized to have resulted in concentration of power at the export market, mounting illegal trade across borders, unhealthy competition in the primary and auction markets, and high transaction costs (Petit 2007).
Figure 1. Nominal Rate of Assistance for Ethiopia (coffee)

Source: Authors’ construct with data from Anderson and Nelgen (2012).

The reform has also been criticized for contributing to poor quality control in the early years of liberalization (ICO/CFC, 2000). Compared to the Dirge (military) regime where much emphasis was placed on quality, internal quality control in the initial phases of the reform was left to the market. This however is currently being addressed by the Coffee and Tea Authority (CTA) through cupping (coffee tasting) before auction, and with auction price closely related to quality. The quality of coffee is affected by the production system used, hence the need to throw some light on the coffee production systems in Ethiopia.

3. Coffee Production Systems in Ethiopia

With approximately 95% of coffee production in Ethiopia been considered organic, coffee production in the country is categorized into four (4) systems namely forest coffee, semi-forest coffee, garden coffee and plantation coffee (Ministry of Trade 2012).

- **Forest Coffee:**
  This system of production is found mostly in the South and South-Western Ethiopia, specifically in Bale, West Wolega, Metu, Keficho-Shekicho, Bench-Maji and Jimma. These areas are regarded as the origin of Coffea arabica (Arabica coffee). Forest coffee is not intentionally grown by growers, but is rather self-sown and grows under the shade of natural forest trees. This type of coffee offers a wide diversity for selection and breeding so as to have plant stock selected for disease resistance, high yields and of good quality in terms of aroma and flavor. Production under this system represents 10% of national output.

- **Semi-Forest Coffee:**
  Accounting for 35% of national coffee production, this system of production is also found in the Southern and South-Western parts of Ethiopia. Trees under this system enjoy relatively more sunlight than those under the forest coffee system of production. It involves thinning and selection of forest trees by farmers so as to create room for adequate sunlight and at the same time ensure adequate shade.

- **Garden coffee:**
  This system of production is found mainly in the Southern and Eastern parts of the country specifically in South and North Omo, Hararghe, Gedeo, Sidamo, Wolega and Gurage zones. It accounts for approximately 50% of national production and is located near residences of growers. It is planted at low densities and is mostly fertilized with organic materials.

- **Plantation coffee:**
  Accounting for 5% of national production, plantation coffee is grown on state-owned plantations (with some currently been privatized) and on well managed smallholder coffee farms. Vital agronomic practices like
weeding, spacing; fertilizer and herbicide application (for state-owned plantations), maturing, and shade regulation among others are practiced under this system.

4. Developments in Domestic Supply Indicators

Until the year 2004, coffee production in Ethiopia was driven more by improvements in yield than by expansion in area harvested. Area harvested of coffee in the country has over the period 1971-2011 been directly proportional to world price of the crop, decreasing continuously from 622,000 hectares in 1971 to 282,313 hectares in 1991 (a decrease of 54.61%). Production and yield on the contrary, increased respectively from 182,200 tons in 1971 to 210,000 in 1991 (an increase of 15.26%) for production and 0.293 Mt/ha in 1971 to 0.744 Mt/ha in 1991 (an increase of 153.92%) for yield. The general decline observed in world price of coffee during the aforementioned periods, coupled with high farm taxation and strict farmers’ quota applied prior to the reform in 1991, led to switching of most farmers from production of coffee into production of Chat (a stimulant and substitute for coffee in Ethiopia).

Introduction of higher prices through reduction in farm taxation and ending of farmers’ quota in the early years of the reform between 1991 and 1993 triggered a return of most farmers into coffee production. With liberalization of internal marketing and improvement in production and marketing conditions in the country came significant increases in harvested area, yield and production. Harvested area increased from 282,313 hectares in 1991 to 498,618 hectares in the year 2011 (19.84% less than the value for 1971 but 76.62% over the value for 1991). Production increased from 210,000 tons in 1991 to 370,569 tons in 2011 (an increase of 103.61% over the value for 1971 and 76.46% over the value for 1991). Yields however, between the two years was almost the same, 0.744 for 1991 and 0.743 for 2011. Regardless of the stagnation observed in yields for the two periods (1991 and 2011), major improvements were observed in productivity between the years 1994 and 2003 when average yields were in the range of 0.865 Mt/ha for 1999 and 1.03 Mt/ha for the year 2003. The highest yield (1.10 Mt/ha) for the period 1961-2011 was observed however in the year 2007, with the lowest been observed in the year 1962 (0.22 Mt/ha). Productivity (yield) of coffee in Ethiopia since the year 2004 has been generally unsatisfactory compared to the preceding decade (1994-2003). The highest value of harvested area (622,000 hectares) was observed in the year 1971 with the lowest (218,343 hectares) observed in the year 2003. Lowest output (127,400 tons) was observed in the year 1961, with the highest observed in the year 2011 (370,569 tons).

![Figure 2. Developments in coffee production, harvested area and yields](image)

**Source:** Authors’ construct with data from FAOSTAT

Although the trend in yields of coffee in Ethiopia has been generally positive, there still exists room for further improvement as the national average yield (0.743 Mt/ha) lags well behind yields in other major exporting countries like Vietnam (2.1879 Mt/ha), Costa Rica (1.0106 Mt/ha), Brazil (1.2567 Mt/ha), Guatemala (0.9717 Mt/ha), and Honduras (1.0659 Mt/ha). Furthermore, it is below the world average yield for coffee green (0.7907). It is however well above the
average for the continent (Africa) (0.4719Mt/ha), Kenya (0.2266Mt/ha), Indonesia (0.4903Mt/ha) and Colombia (0.6331Mt/ha). All the reported yield figures for the respective countries for the year 2011, shows that with the adoption of appropriate technologies, Ethiopia stands a chance of increasing its national average yield of coffee, a requirement vital for enhancing competitiveness of the coffee subsector in the country.

5. Developments in Export of Coffee Green

Exports of coffee green from Ethiopian have over the past five decades increased from 56,024 tons in 1961 to 211,840 tons in the year 2010 (an increase of 278.12%). In monetary terms, exports of coffee green increased from approximately $38million in 1961 to $677million in 2010 (an increase of 1681.58%). Most of the improvements in both volume and value of exports were observed after the year 2003. Relative stagnation in exports between the years 1961 and 1991 could be attributed to inefficiencies in marketing and policy environment under the former regimes and to the volatile nature of world price of the commodity. The lowest volume of export (43,858 tons) was observed in the year 1992, with the highest (211,840 tons) observed in the year 2010. In value terms, the highest value ($677million) for coffee export was observed in the year 2010, with the lowest ($37,558million) recorded in the year 1961.

![Figure 3. Developments in export of coffee green](image)

Source: Authors’ construct with data from FAOSTAT

6. Domestic Consumption of Coffee

With Ethiopian being not only a major producer and exporter of coffee, but as well the highest consumer thereof in Africa, approximately 51% of production was locally consumed in 1961, 64% in 1985, 62% in 1986, 65% in 1987, 51% in 2007 and 52% in the year 2009. The quantities of production consumed domestically were relatively higher prior to the reform in 1991. This could be attributed to the relatively lower number of exporters under the former regimes (especially the Dirge regime), declines in world price of coffee which decreased incentive for exporters to increase the volume of exports thereby making larger volume available on the domestic market for consumption, and to the increases in output observed during the pre-reform period. Share of consumption in total production in the immediate years following initiation of the reform were relatively lower, decreasing from as high as 65% in 1987 to 25% in 2003. It however has taken on an increasing trend since the year 2004. The relatively smaller share of domestic consumption in production in the early years of the reform could be attributed to increases in exports observed in the country during that period as a result of increases in the number of exporters following the liberalization of internal marketing.
Figure 4. Developments in domestic consumption of coffee

Source: Authors’ construct with data from FAOSTAT

7. Developments in Producer Price of Coffee for Ethiopia
Finding up-to-date data on producer price (Birr) for Ethiopia has been an uphill task; therefore the current study assessed developments in producer price for the period 1967 to 2005 which was available, to provide some basis for inference. Both real and nominal prices for coffee green were highly volatile (fluctuating) over the entire period, depicting an increasing trend however from the year 1992 (except for the years 1996, 1997, 1998, 2002 and 2003 where some declines were observed). The lowest nominal producer price of coffee per tonne (1040 Birr) was observed in the year 1969, with the highest (12,467 Birr) recorded in the year 2005. The nominal prices for growers were relatively higher in the post-reform period ranging between 1,670 Birr for the year 1992 and 12,467 Birr for 2005, compared to the pre-reform range of 1040 Birr for the year 1969 and 4224 Birr for 1989.

Figure 5. Real and nominal producer prices for coffee green in Ethiopia

Source: Authors’ construct with data from FAOSTAT

In real terms however, the highest price (18,913 Birr) was observed in the year 1977, with the lowest (2808 Birr) recorded in the year 1992. The real prices in contrast to the nominal prices, were relatively higher in the pre-reform...
period, and declined continuously from as high as 18,913 Birr in the year 1977 to 2808 Birr in the year 1992, depicting a general increasing trend thereafter.

8. Coffee Supply Chain of Ethiopia

The supply of coffee for Ethiopia is characterized by a long-chain with several intermediaries. Primary suppliers of the coffee berries are of two forms namely, small-holder coffee farmers (who actually grow coffee in gardens close to their residences or in mini-plantations) and collectors of forest and semi-forest coffee. In considering the two forms of primary suppliers, the small-holder farmers make use of vital inputs of production like land and labor although coffee production in Ethiopia is generally a low input activity. On turning bright red on the trees, coffee berries are picked by farmers and collectors of the forest and semi-forest coffee. Most of the growers who are affiliated to coffee cooperatives send the picked berries to the cooperative organization for washing or sun-drying and de-pulping. Figure 6 is a summary of the supply chain of coffee in Ethiopia.

Farmers who reside in distant villages far from pulpery or any cooperative organization mostly sundry the beans themselves, remove the husks, and transport them to the primary market centers. Collectors of forest and semi-forest coffee also take their sundried beans to the primary market centers. In the primary market centers, the sun-dried beans are sold to the licensed collectors (Sebsabys), who in turn are required to sell the sundried beans to the wholesalers (Akrabies) or the Ethiopian Coffee Purchase and Sales Enterprise (ECPSE) wing of the former Ethiopian Coffee Marketing Corporation (ECMC). Sebsabys are permitted to buy from farmers but can only sell to Akrabies or the ESPE, and cannot take coffee directly to the auction because Akrabies, Sebsabys and exporters have separate and different licenses. Akrabies are permitted to buy coffee from Sebsabys (but not from farmers) and deliver it to the processing centers and to the auction thereafter, but not export it. Exporters are only permitted to buy coffee from the auction and not from Sebsabys or farmers (ICO/CFC, 2000).

Sebsabys have a monopoly on primary marketing of sub-dried coffee in the private sector (except for the production handled by cooperatives) since producers are not permitted to deliver unwashed coffee directly to Akrabies. After the preliminary activities of washing and de-pulping berries brought to them by their members, the cooperative organizations send the washed coffee to Cooperative Unions, who together with the Akrabies or the ESPE have right to send the beans to processing centers from whence they are delivered to the central auction markets in Addis Ababa and Dire Dawa. Since the year 2001, Cooperative Unions have been given permit by the government to engage in direct sales without necessarily involving parastatals; unions with sufficient capital export directly without necessarily getting their produce to the auction markets (Dempsey and Campbell, undated). Such actions however have quality implications in the long run. At the auction markets, exporters purchase coffee, process it to export standard and then export it to destinations abroad. Some of the processed product are however sold to local wholesalers and retailers and then to consumers from there. As of the year 2010/2011, 32.61% of processed coffee from Ethiopia was exported to Germany, 11.43% to the United States of America, and 11.38% to Saudi Arabia. Belgium, Italy, France and Sweden were as well major destinations for Ethiopian coffee exports.
Figure 6. Coffee supply chain of Ethiopia

Source: Authors’ construct

Table 1. Value of export by destinations for 2010/2011

<table>
<thead>
<tr>
<th>No</th>
<th>Country</th>
<th>Value ($)</th>
<th>%Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Germany</td>
<td>274,430,356</td>
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</tr>
<tr>
<td>2</td>
<td>United States of America</td>
<td>96,229,081</td>
<td>11.43</td>
</tr>
<tr>
<td>3</td>
<td>Saudi Arabia</td>
<td>95,789,714</td>
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</tr>
<tr>
<td>4</td>
<td>Belgium</td>
<td>65,709,947</td>
<td>7.81</td>
</tr>
<tr>
<td>5</td>
<td>Italy</td>
<td>56,316,894</td>
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</tr>
<tr>
<td>6</td>
<td>France</td>
<td>42,903,597</td>
<td>5.10</td>
</tr>
<tr>
<td>7</td>
<td>Sweden</td>
<td>40,234,422</td>
<td>4.78</td>
</tr>
<tr>
<td>8</td>
<td>Japan</td>
<td>34,235,899</td>
<td>4.07</td>
</tr>
</tbody>
</table>
In the international market, the imported product is distributed to wholesalers (large supermarkets), to retailers and then to consumers. A report by the European Commission (2011) has shown that Ethiopia’s Specialty Coffees (Sidamo, Yirgacheffee and Harar) are sold from US$5-9 per kg FOB whereas the retail market price of these Specialties is above US$ 50 per kg. The share of the small scale producer has also been revealed to be on average 2.8% of the retail price.

Source: Ministry of Trade, 2012.

Although a major exporter of coffee, data sourced from the agricultural production database of the FAO indicates that in the years 2006 and 2008, Ethiopia imported respectively 40,928 tons and 27,103 tons of coffee green at values of approximately $88 million and $85m. This implies that Ethiopia engages not only in inter-commodity trade, but also in intra-commodity trade. Nonetheless, the country remains a major net exporter of coffee given that its meagre imports are even irregular.

9. Global Exports and Imports of Coffee

Global exports of coffee green increased from approximately 5.922 million tons in the year 2006 to 6.581 million tons in 2010 (representing an increase of 11.13%). Over the period 2006-2010, a total of 51.37% of world exports of coffee green were from the Americas, 29.59% from Asia and Oceania, 10.44% from Africa and 8.58% from Europe. At the country level, Brazil accounted for 25.42% of global coffee green exports during the aforementioned period, Vietnam
18.08%, Colombia 8.66%, Indonesia 6.85%, Guatemala 3.63%, Peru 3.40%, Honduras 3.16%, Ethiopia 2.76% and India 2.54%. Mexico, Costa Rica and Nicaragua jointly accounted for 4.73% of world coffee green exports between the years 2006 and 2011.

**Table 2. World exports of coffee green**

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>World Total</td>
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<td>6158</td>
<td>6346</td>
<td>6305</td>
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<td>6262</td>
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<td>Total Americas</td>
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<td>3197</td>
<td>3292</td>
<td>3167</td>
<td>3306</td>
<td>3217</td>
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<tr>
<td>Total Asia and Oceania</td>
<td>1712</td>
<td>1825</td>
<td>1812</td>
<td>1937</td>
<td>1980</td>
<td>1853</td>
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<tr>
<td>Total Africa</td>
<td>656</td>
<td>690</td>
<td>640</td>
<td>611</td>
<td>675</td>
<td>654</td>
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<tr>
<td>Total Europe</td>
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<td>445</td>
<td>602</td>
<td>589</td>
<td>619</td>
<td>537</td>
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<td>Brazil</td>
<td>1476</td>
<td>1488</td>
<td>1567</td>
<td>1639</td>
<td>1791</td>
<td>1592</td>
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<tr>
<td>Vietnam</td>
<td>981</td>
<td>1232</td>
<td>1061</td>
<td>1168</td>
<td>1218</td>
<td>1132</td>
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<tr>
<td>Colombia</td>
<td>600</td>
<td>637</td>
<td>603</td>
<td>458</td>
<td>410</td>
<td>542</td>
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<td>Indonesia</td>
<td>412</td>
<td>321</td>
<td>468</td>
<td>510</td>
<td>433</td>
<td>429</td>
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<td>Guatemala</td>
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<tr>
<td>Peru</td>
<td>238</td>
<td>174</td>
<td>225</td>
<td>197</td>
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<td>Honduras</td>
<td>172</td>
<td>207</td>
<td>199</td>
<td>199</td>
<td>215</td>
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<tr>
<td>Ethiopia</td>
<td>188</td>
<td>158</td>
<td>179</td>
<td>130</td>
<td>212</td>
<td>173</td>
</tr>
<tr>
<td>India</td>
<td>188</td>
<td>153</td>
<td>150</td>
<td>126</td>
<td>178</td>
<td>159</td>
</tr>
<tr>
<td>Mexico</td>
<td>124</td>
<td>135</td>
<td>109</td>
<td>129</td>
<td>103</td>
<td>120</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>96</td>
<td>91</td>
<td>110</td>
<td>78</td>
<td>74</td>
<td>90</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>83</td>
<td>73</td>
<td>91</td>
<td>80</td>
<td>102</td>
<td>86</td>
</tr>
</tbody>
</table>

**Source:** Authors' computation with data from FAOSTAT

As may be seen from table 3, Europe accounted for 55.37% of total coffee green imports between the years 2006 and 2011, when world imports increased from approximately 5.743 million tons to 6.249 million tons (representing an increase of 8.81%).

**Table 3. World imports of coffee green**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>World Total</td>
<td>5743</td>
<td>5904</td>
<td>6047</td>
<td>6036</td>
<td>6249</td>
<td>5996</td>
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<tr>
<td>Total Europe</td>
<td>3163</td>
<td>3242</td>
<td>3355</td>
<td>3359</td>
<td>3481</td>
<td>3320</td>
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<tr>
<td>Total Americas</td>
<td>1496</td>
<td>1516</td>
<td>1528</td>
<td>1498</td>
<td>1564</td>
<td>1520</td>
</tr>
<tr>
<td>Total Asia and Oceania</td>
<td>831</td>
<td>912</td>
<td>868</td>
<td>921</td>
<td>984</td>
<td>903</td>
</tr>
</tbody>
</table>
During this period, the Americas accounted for 25.35% of global coffee green imports, Asia and Oceania 15.06% and Africa 4.20%. At the country level, most of such imports were into the United States of America (21.46%), Germany (17.41%), Italy (7.54%), Japan (6.69%), Belgium (4.69%), France (4.02%) and the United Kingdom (2.07%). The Netherlands, Finland and Austria jointly account for 3.69% of global imports between the years 2006 and 2011.

2.1. Model Specification and Data
The current study analyzes the performance of Ethiopia in export of coffee green (for the period 1961-2010) and estimates the magnitude and effects of key economic determinants of coffee exports, producer price and production (for the period 1981-2005). Data used in the current study were sourced from the agricultural production database of the FAO (FAOSTAT), the United Nations Conference on Trade and Development (UNCTAD) and the International Rice Research Institute (IRRI). In the following sessions, several indices and models for determining and assessing the performance of Ethiopia in coffee trade have been discussed; but first of all, why do countries engage in trade in the first place?

2.2. Competitiveness
Trade theory suggests that countries do engage in trade in order to take advantage of differences among them in terms of factor endowments and technology and that the competitiveness of a country for a specific commodity is based on the concept of comparative advantage. Several trade measures have been used in past studies for measuring a country’s competitiveness in a commodity. Among such are the Revealed Comparative Advantage (RCA) (Balassa 1965), Relative Import Advantage and Relative Trade Advantage (Vollrath 1991), the Revealed Symmetric Comparative Advantage (as index of competitiveness) (Nwachuku et al. 2010) and the Net Export Index (NEI) (Banterle and Carraresi 2007). In this study however, the competitiveness of Ethiopia in its export of coffee green is analyzed using the Revealed Comparative Advantage (RCA) and the Revealed Symmetric Comparative Advantage.

- Revealed Comparative Advantage, RCA
Bearing the same meaning as the revealed export advantage, the RCA measure calculates the ratio of a country’s export share of a commodity in the international market to the country’s export share of all other commodities. In the current study, RCA is defined as follows:

$$
RCA_{ij} = \frac{X_{ij}}{X_{it}} / \frac{X_{jw}}{X_{tw}}
$$

Where $X_{ij}$ is the value of Ethiopia’s exports of coffee green; $X_{it}$ is the total value of agricultural exports of Ethiopia; $X_{jw}$ is the value of world exports of coffee green; and $X_{tw}$ is the total value of world agricultural exports.

- Revealed Symmetric Comparative Advantage (RSCA)
The Revealed Symmetric Comparative Advantage measure reflects the RCA in its symmetric form as an index of competitiveness. It is computed as follows:

\[ \text{RSCA} = \frac{\text{RCA} - 1}{\text{RCA} + 1} \]

and it ranges from -1 to +1. The closer the value is to +1, the higher the competitiveness of a country in the commodity of interest. The analysis is focused on three distinct periods namely 1961-1973 (era of the semi-feudal imperial government), 1974-1991 (era of the Military rule with Marxist ideological orientation), and from 1992-2010 (era of the federal government—period of reform and liberalization of internal marketing).

2.3. Determinants of Coffee Exports, Producer Price and Production

In estimating the magnitude and effects of key economic determinants of exports, producer price and production for Ethiopia, three models were specified and estimated with the OLS estimator after verification of data on the respective series through the Phillips-Perron unit root test.

Equation 1: Determinants of coffee green exports

\[ \ln \text{EX}_t = \beta_0 + \beta_1 \ln \text{PRO}_t + \beta_2 \ln \text{PPR}_t + \beta_3 \ln (\text{WCP}_t/\text{PPR}_t) + \beta_4 \ln \text{NRA}_t + \beta_5 \ln \text{CONS}_t + \beta_6 \ln \text{EXR}_t + \beta_7 \ln \text{FDI}_t + \epsilon_t \]

\[ \text{A priori exp: } \text{PRO}_t > 0; \text{PPR}_t > 0; (\text{WCP}_t/\text{PPR}_t) > 0; \text{NRA}_t > 0; \text{FDI}_t > 0; \text{EXR}_t > 0; \text{CONS}_t < 0 \]

Equation 2: Determinants of domestic producer price of coffee

\[ \ln \text{PPR}_t = \beta_0 + \beta_1 \ln \text{PPR}_{t-1} + \beta_2 \ln \text{WCP}_t + \beta_3 \ln \text{NRA}_t + \beta_4 \ln \text{CONS}_{t-1} + \beta_5 \ln \text{EXR}_t + \beta_6 \ln \text{CPD}_t + \epsilon_t \]

\[ \text{A priori exp: } \text{PPR}_{t-1} > 0; \text{WCP}_t > 0; \text{NRA}_t > 0; \text{CONS}_{t-1} > 0; \text{EXR}_t > 0; \text{CPD}_t > 0; \text{PRO}_t < 0 \]

Equation 3: Determinants of coffee green production

\[ \ln \text{PRO}_t = \beta_0 + \beta_1 \ln \text{YLD}_t + \beta_2 \ln \text{PPR}_t + \beta_3 \ln (\text{WCP}_t/\text{PPR}_t) + \beta_4 \ln \text{NRA}_t + \beta_5 \ln \text{RSCA}_t + \beta_6 \ln \text{ALF}_t + \epsilon_t \]

\[ \text{A priori exp: } \text{YLD}_t > 0; \text{PPR}_t > 0; (\text{WCP}_t/\text{PPR}_t) > 0; \text{NRA}_t > 0; \text{FDI}_t > 0; \text{RSCA}_t > 0; \text{ALF}_t > 0 \]

Where

- \( \text{EX}_t \) - quantity of coffee green export (tons),
- \( \text{PRO}_t \) - Coffee green production (tons),
- \( \text{PPR}_t \) - domestic producer price of coffee green (LCU),
- \( \text{WCP}_t/\text{PPR}_t \) - World price (Brazilian Natural) to domestic producer price ratio of coffee green,
- \( \text{NRA}_t \) - Nominal rate of assistance (%),
- \( \text{CONS}_t \) - Domestic consumption of coffee (tons),
- \( \text{EXR}_t \) - Exchange rate (Ethiopian Birr/ US$),
- \( \text{FDI}_t \) - foreign direct investment (US$ millions at current prices and current exchange rates),
- \( \text{YLD}_t \) - Yield of coffee green (Mt/ha),
- \( \text{RSCA}_t \) - Revealed Symmetric Comparative Advantage (index of competitiveness),
- \( \text{ALF}_t \) - Agricultural labor force (‘000’ persons),
- \( \beta_0 \) - Intercept term,
- \( \beta_i \) - Coefficients/ elasticities,
- \( \epsilon_t \) - Stochastic error term assumed to be iidN(0\(\Sigma\)).

3.1 Results

This section is divided into two parts:

- The first focuses on analyzing Ethiopia’s performance in export of coffee green under the three past and present regimes (semi-feudal imperial government, the Dirge/military regime, and the federal government).
- The second part focuses on estimating the magnitude and effects of the specified determinants of coffee exports, producer price and production.

3.2. Competitiveness of Ethiopia’s Coffee Green Exports

Results of both Revealed Comparative Advantage and Revealed Symmetric Comparative Advantage show that Ethiopia has comparative advantage in export of coffee green. Its performance in export of the crop was lowest under the imperial regime (1961-1973) and generally unsatisfactory for the entire period (1961 – 2010).

Characterized by a free market system where traders bought and directly exported coffee beans at any time along the supply chain, the local coffee industry under the imperial regime lacked a well-developed market structure and had quality problems with the beans exported from the country due to the minimum emphasis placed on quality under this regime. Growth in production of coffee during this era was as well hampered by low yields. These factors hindered
any improvement in the performance of the country in coffee exports and at the latter stage of the regime, led to a decline in the country’s performance between the years 1971 and 1973 when RCA decreased from 12.43 in 1971 to 8.89 in 1973, with RSCA also decreasing from 0.85 in 1971 to 0.80 in 1973.

A move from the imperial to the military regime led to a high state involvement in coffee marketing. Under the military rule, private traders were constrained in their activities through licensing requirements, high fees and taxes levied by the government, and growers were not left out: they were heavily taxed. In addition, prices of the produce were fixed by the Ministry of Tea and Coffee Development giving no flexibility in terms of time and prices to the growers. These inhibitions in the trading environment limited competition on the market, led to drifting of most farmers from coffee production into the production of ‘Chat’, and triggered large scale smuggling into neighboring countries. These responses precluded improvement in the country’s competitiveness in export of coffee in the early years of the regime.

In addition, the world price of coffee was on a decline for most years under this regime, thereby further reducing incentives for most growers and private traders to engage in trade under the military regime. The early years under this government system between 1974 and 1980 saw no major improvements in the country’s performance. Relatively low transaction cost in coffee trading under the military government and greater emphasis placed on quality control at the latter years (1986-1991) helped improve the country’s performance in exports of coffee, as mirrored by increase of the RCA from 12.20 in 1985 to 36.09 in 1991, with the RSCA also increasing from 0.85 to 0.95. The military government following the short improvement in export performance between 1986 and 1991 was however replaced by the federal (reformist) government in 1991.

Partial liberalization, reduction in export and farm taxes, abolition of farmer’s quota and withdrawal of constraints on trading activities of private traders under the reformist government attracted more exporters and intermediaries into the sector. Most farmers returned into production of coffee due to the relatively more favorable environment created under the reformist government, and smuggling was minimized due to the price incentive created through reduction in farm taxation. These factors boosted the country’s performance in export of coffee in the early years of the reformist regime (between 1995 and 2001). During this period, RCA increased from 25.82 in 1995 to 53.45 in 2001, with RSCA also increasing from 0.93 in 1995 to 0.96 in 2001.

Table 4. Coffee export performance of Ethiopia

<table>
<thead>
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<th>Year</th>
<th>Revealed Comparative Advantage</th>
<th>Revealed Symmetric Comparative Adv.</th>
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</thead>
<tbody>
<tr>
<td>1961</td>
<td>10.2547</td>
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</tr>
<tr>
<td>1962</td>
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</tr>
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<td>1963</td>
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<td>1967</td>
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<td>Year</td>
<td>Revealed Comparative Advantage</td>
<td>Revealed Symmetric Comparative Adv.</td>
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</tr>
<tr>
<td>1999</td>
<td>32.9317</td>
<td>0.9411</td>
</tr>
<tr>
<td>2000</td>
<td>36.3618</td>
<td>0.9465</td>
</tr>
<tr>
<td>2001</td>
<td>53.4545</td>
<td>0.9633</td>
</tr>
<tr>
<td>2002</td>
<td>39.8307</td>
<td>0.9510</td>
</tr>
<tr>
<td>2003</td>
<td>37.5205</td>
<td>0.9481</td>
</tr>
<tr>
<td>2004</td>
<td>43.5336</td>
<td>0.9551</td>
</tr>
<tr>
<td>2005</td>
<td>28.5247</td>
<td>0.9323</td>
</tr>
<tr>
<td>2006</td>
<td>29.9219</td>
<td>0.9353</td>
</tr>
<tr>
<td>2007</td>
<td>26.0698</td>
<td>0.9261</td>
</tr>
<tr>
<td>2008</td>
<td>26.6112</td>
<td>0.9276</td>
</tr>
<tr>
<td>2009</td>
<td>18.3463</td>
<td>0.8966</td>
</tr>
<tr>
<td>2010</td>
<td>22.8338</td>
<td>0.9161</td>
</tr>
</tbody>
</table>

**Source:** Authors' computation with data from FAOSTAT
Authorizing Cooperative Unions to engage in direct exports and sales without necessarily involving parastatals, and private exporters to engage in domestic marketing of coffee at market prices triggered an increase in the number of exporters and intermediaries in the supply chain from the year 2001 onwards. This led to an extensive supply chain involving numerous actors and processing activities, thereby widening the gap between time of purchase of beans from buyers and sales to exporters at the auction.

Along with this wide gap resulted a challenge with management of price risk due to the highly volatile nature of coffee prices. Quality control also became a challenge as interior control of quality was no more under the control of exporters as they were in the latter stages of the military regime. With minimum state supervision and increased ability of Cooperative Unions to engage in direct export, competition became unnecessarily high in both the primary and auction markets. The increasing number of actors and processes in the chain also led to increasing transaction costs. These resulted in a gradual decline in the country’s export performance from the high RCA value of 53.45 in 2001 to 22.83 in 2010, with RSCA also decreasing from 0.96 in 2001 to 0.92 in 2010. The performance of the country in export of coffee has since the year 2002 taken on a declining trend in spite of the increases observed in world price of coffee between the years 2002 and 2007).

By these changes, it is noted that the performance of the country in export of coffee has under the various regimes been generally unsatisfactory. It was hindered by poor market structure, low productivity of grower’s fields, and poor quality control under the imperial regime. Under the military regime, it was hindered by limited competition on the market, smuggling and drifting of most farmers from coffee production into the production of ‘Chat’ due to high taxes on farmers’ incomes, and by the collapse in world price of coffee. Under the imperial regime, it is hindered by challenges in management of price risk due to the wide gap between time of purchase of beans from growers and sales to exporters, quality control problems, unnecessary competition in both primary and auction markets due to the numerous players in the extensive supply chain, and by increasing transaction costs.

3.3. Determinants of Coffee Export, Production and Producer Price

As a vital step in the data generation process and in choosing the appropriate estimator, the whole set of data (with all variables in log except nominal rate of assistance (NRA) and foreign direct investment (FDI)) was verified through the Phillips-Perron unit root test. Output of the test shows that with the exception of the variable ‘exchange rate (EXR)’, all the other variables specified in the three regression equations are non-stationary at level, but become stationary on first difference at the 1% level. The variable ‘exchange rate (EXR)’ was found to be an $I(2)$ variable, implying that it becomes stationary on second difference, and is in the current study found stationary at the 1% level. To help capture its effects on coffee exports and prices however, the variable EXR was replaced with its first difference ($\Delta \ln \text{EXR}$). Having made all the variables $I(1)$ through this replacement, the respective equations were then estimated using the Ordinary Least Squares and tested for appropriate standard Gaussian properties. Results of the diagnostic tests on the Gaussian assumptions for the respective models indicate that the residual series for the respective models are normally distributed homoscedastic and free from the problem of serial correlations.

Table 5. Unit root test of variables (trend+ intercept at level, intercept at 1st and 2nd difference)

<table>
<thead>
<tr>
<th>Series</th>
<th>PP-test stat</th>
<th>N-W Bandwidth</th>
<th>PP-test stat</th>
<th>N-W Bandwidth</th>
<th>Conclusion on</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level</td>
<td></td>
<td>1st and 2nd Diff.</td>
<td></td>
<td>Level</td>
</tr>
<tr>
<td>In EX</td>
<td>-2.204377</td>
<td>1</td>
<td>-4.983489***</td>
<td>2</td>
<td>$I(1)$</td>
</tr>
<tr>
<td>In PRO</td>
<td>-1.972720</td>
<td>0</td>
<td>-4.786777***</td>
<td>2</td>
<td>$I(1)$</td>
</tr>
<tr>
<td>In CONS</td>
<td>-2.129521</td>
<td>0</td>
<td>-3.961341***</td>
<td>2</td>
<td>$I(1)$</td>
</tr>
<tr>
<td>NRA</td>
<td>-2.467563</td>
<td>1</td>
<td>-5.646206***</td>
<td>3</td>
<td>$I(2)$</td>
</tr>
<tr>
<td>In EXR</td>
<td>-1.868880</td>
<td>2</td>
<td>-6.641161***</td>
<td>7</td>
<td>$I(2)$</td>
</tr>
<tr>
<td>In PPR</td>
<td>-2.390771</td>
<td>3</td>
<td>-4.520276***</td>
<td>8</td>
<td>$I(1)$</td>
</tr>
<tr>
<td>FDI</td>
<td>-2.950608</td>
<td>5</td>
<td>-6.646939***</td>
<td>22</td>
<td>$I(1)$</td>
</tr>
<tr>
<td>In ALF</td>
<td>-2.248686</td>
<td>0</td>
<td>-4.874804***</td>
<td>2</td>
<td>$I(1)$</td>
</tr>
<tr>
<td>In YLD</td>
<td>-0.650916</td>
<td>2</td>
<td>-4.649091***</td>
<td>2</td>
<td>$I(1)$</td>
</tr>
<tr>
<td>In RSCA</td>
<td>-1.907906</td>
<td>1</td>
<td>-3.946510***</td>
<td>1</td>
<td>$I(1)$</td>
</tr>
<tr>
<td>In WCP</td>
<td>-2.306167</td>
<td>1</td>
<td>-4.578313***</td>
<td>0</td>
<td>$I(1)$</td>
</tr>
</tbody>
</table>
3.3.1. Determinants of coffee exports (EX)

The volume of coffee exported from Ethiopia is found to be significantly dependent on lagged domestic producer price, lagged world price (Brazilian Natural) to domestic producer price ratio, nominal rate of assistance, domestic consumption of coffee, foreign direct investment, and on lagged exchange rate. The intercept term had a positive coefficient significant at the 1% level, indicating that should all the other variables remain constant, Ethiopia will continue to export significant volumes of coffee green unto the international market.

Table 6. Determinants of coffee exports for Ethiopia

<table>
<thead>
<tr>
<th>Variables</th>
<th>coefficients</th>
<th>standard error</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>15.74279</td>
<td>4.647095</td>
<td>3.387663***</td>
</tr>
<tr>
<td>ln PPR_{t-1}</td>
<td>0.634617</td>
<td>0.184336</td>
<td>3.442723***</td>
</tr>
<tr>
<td>ln (WCP_{t-1}/PPR_{t-1})</td>
<td>0.570133</td>
<td>0.192530</td>
<td>2.961267***</td>
</tr>
<tr>
<td>NRA_t</td>
<td>1.241461</td>
<td>0.658359</td>
<td>1.885691*</td>
</tr>
<tr>
<td>ln CONS_t</td>
<td>-0.658376</td>
<td>0.261957</td>
<td>-2.513301**</td>
</tr>
<tr>
<td>ln FDI_t</td>
<td>0.001033</td>
<td>0.000441</td>
<td>2.341297**</td>
</tr>
<tr>
<td>∆ ln EXR_{t-1}</td>
<td>1.120736</td>
<td>0.444415</td>
<td>2.521826**</td>
</tr>
<tr>
<td>ln PRO_{t-1}</td>
<td>0.007101</td>
<td>0.358721</td>
<td>0.019796</td>
</tr>
<tr>
<td>Adj. R^2</td>
<td>0.636234</td>
<td>Mean dependent var</td>
<td>11.42490</td>
</tr>
<tr>
<td>F-statistic</td>
<td>6.496930</td>
<td>S.D dependent var</td>
<td>0.340907</td>
</tr>
<tr>
<td>Prob. (F-statistic)</td>
<td>0.001209</td>
<td>S.E of regression</td>
<td>0.205611</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>8.660724</td>
<td>Sum-squared resid</td>
<td>0.634138</td>
</tr>
<tr>
<td>Durbin-Watson stat</td>
<td>2.145649</td>
<td>Jarque-Bera</td>
<td>1.772691 (0.412159)</td>
</tr>
<tr>
<td>Akaike info criterion</td>
<td>-0.057454</td>
<td>B-G LM Test (1.2): 0.338 (0.57);</td>
<td>1.668 (0.227)</td>
</tr>
<tr>
<td>Hannan-Quinn criter.</td>
<td>0.041876</td>
<td>ARCH Test, F-stat: 0.057 (0.8124)</td>
<td>2.125 (0.346)</td>
</tr>
<tr>
<td>Schwarz criterion</td>
<td>0.337500</td>
<td>Q-stat(1,2): 0.257 (0.612);</td>
<td>2.125 (0.346)</td>
</tr>
<tr>
<td>ADF Test of Residual</td>
<td>-4.998177***</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Lagged domestic producer price has a coefficient of 0.635, significant at the 1% level. This implies that export of coffee green in time \( t \) increases by 0.635% for a unit increase in domestic producer price in time \( t-1 \). With coffee production in Ethiopia being a low input activity (use is made mostly only of land, seed and labor), increases in producer price would help increase output through employment of more hands at harvest to ensure timely picking of adequate amount of berries and to expand current area under production (with accumulation of enough funds). More importantly, prices offered producers by buyers influence their decision on selling of the produce either on the domestic market or smuggling it into neighboring countries for better prices. With smuggling having been identified as a major problem in the Ethiopian coffee industry by previous researchers (including Petit (2007), AMPD (2006), and ICO/JFC (2000)), increasing producer price could help minimize incidence of smuggling, thereby making more coffee beans available for processing and export.
A unit increase in lagged world price to producer price ratio of coffee green leads to an increase of 0.570% in exports of coffee green, significant at the 1% level. A priori, the effect of an increase in this ratio was believed could go either way due to the fact that such increases are possible under four different scenarios (Boansi 2013):

- Increases in world price, whiles domestic price is held constant,
- Decreases in domestic price, whiles world price is held constant,
- Increases in both, but more in world price than in domestic price,
- Decreases in both, but more in domestic price than in world price.

The positive and significant coefficient observed for the price ratio indicates that in as much as exporters would respond positively and significantly to increases in this ratio, any negative response on the part of growers (when victimized) is not significant. This reflects a high dependence of farmers on the crop for sustenance.

Nominal rate of assistance (government support to coffee producers reflected by the level of farm taxation) has a positive association (1.24) with export of coffee green, significant at the 10% level. Increasing government assistance to farmers through this variable reflects in decreasing taxation of farm incomes. Knowing they would earn a relatively higher income from sales with reduction in farm taxation, both garden coffee and plantation coffee growers, as well as forest and semi-forest coffee collectors are given a reason to invest much time and money in their fields and on labor to pick larger volumes of berries, thereby increasing supply on the market for both domestic consumption and exports. Decreasing farm taxation also helps in minimizing incidence of smuggling of coffee into neighboring countries.

A unit increase in domestic consumption leads to a decrease of 0.658% in exports of coffee, significant at the 5% level. With Ethiopia regarded not only as a major producer and exporter of coffee, but also a major consumer in Africa, a unit increase in domestic consumption significantly decreases the volume available for both export and stock (to make up for future deficits). This effect of domestic consumption on exports could be mitigated by increasing domestic production at equivalent rate or above domestic consumption. Increasing domestic production at such rates does not necessarily translate into significant increases in export as export decisions of exporters depend not only on such rates but also on other vital local and international factors. This statement is made in support of the positive (0.007) yet insignificant coefficient observed for coffee production in the current study.

Foreign direct investment (FDI) has a coefficient of 0.001, significant at the 5% level. This implies that increases in foreign direct investment stimulate growth in export of coffee green. With Ethiopia's coffee production been considered a low input activity, foreign direct investment plays quite minimal roles on the input and production side, but on the broader perspective through international relations leads to trade creation. Investments in developing countries by foreign investors are mostly made in areas (sectors) in which the recipient countries have comparative advantage and such advantages are mostly exploited to further develop the areas/sectors (this however holds in cases where investments are made with an export-oriented motive as against a tariff jumping motive). Increasing foreign direct investment therefore serves as a greater opportunity for Ethiopia to increase its exports through benefits from trade creation resulting from such investment.

Devaluation of the Ethiopian currency through increases in the exchange rate is observed to stimulate growth in exports. Depreciation of the Ethiopian Birr against major international currencies makes exports cheaper and with such condition comes increased incentive to export larger volumes of the export commodity of interest (coffee for the current study). A lagged instead of current exchange rate is used in this study due to the auction system for sales of produce to exporters in the country under study (Ethiopia). An increase in the exchange rate in year t-1 may stimulate growth in export if exporters are able to access enough coffee beans at the auction in that year. Success in accessing and exporting enough beans may result in increased profit for them and put the exporters in a better position to bid in the auction for higher volumes in the subsequent year. A unit increase in lagged exchange rate leads to an increase of 1.121% in Ethiopia's coffee exports. Of the total variations observed in exports of coffee green from Ethiopia, a total of about 63.62% are explained by variables specified in the equation on determinants of coffee exports, and the joint effect of these variables is significant at the 1% level.

3.3.2. Determinants of domestic producer price (PPR)

Domestic producer price of coffee is found to be significantly dependent on lagged domestic producer price, world price, lagged domestic consumption, lagged exports of coffee green, exchange rate, and on production of coffee in the current year. In contrast to observation on the intercept for equation 1 (determinants of coffee exports) however, the coefficient of the intercept for Table 7 is not significant.

<table>
<thead>
<tr>
<th>Variables</th>
<th>coefficients</th>
<th>standard error</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-6.891082</td>
<td>4.577254</td>
<td>-1.505505</td>
</tr>
</tbody>
</table>
This implies that, without a significant change in any of the other variables, there would be no significant change in the domestic producer price of coffee green. With buyers (Sebsabys) having no idea of the price they would receive for the coffee they sell later to the wholesalers (Akribies), and by virtue of determination of market prices through a market mechanism instead of price fixing, prices received by growers from buyers are usually based on previous producer price and on the prevailing world price of coffee. These are the reasons why lagged producer price and current world price are used in equation 2 of section 2.3.

A unit increase in lagged producer price leads to a 0.864% increase in current producer price of coffee, significant at the 1% level. A unit increase in world price of coffee leads to a 0.268% increase in domestic producer price of coffee green, significant at the 10% level. The lower transmission of price increment in times of increasing world price reflects the extensive nature (many intermediaries) of the supply chain for coffee in Ethiopia and the strong effect of transaction cost. A unit increase in exchange rate leads to a 3.019% increase in domestic price of coffee, significant at the 1% level. An increase in exchange rate makes exports cheaper and results in increased demand for coffee beans for export. With increase in demand according to the theory of demand and supply, comes increase in price. In order to exploit benefits from devaluation of the currency (which signals likely increase in demand and higher prices from wholesaler (Akribies) and exporters) buyers increase the price they pay growers by 3.019%.

Increases in demand reflected by both lagged domestic consumption and lagged exports have significant positive effects on producer price. An increase in lagged domestic consumption signals likely increase in conflict between domestic consumption and exports in the current year. To secure higher volumes for sales to the Akribies and later to exporters, buyers increase the price they pay to growers by 0.525% and 0.976% respectively for unit increases in lagged domestic consumption and lagged export of coffee. Increase in supply *ceteris paribus* results in a decrease in producer price by 0.835%, significant at the 5% level. This observation is attributed to the market mechanism used in determining prices paid to growers by buyers in the country. In times of good harvest, buyers reduce the price they pay to growers due to the surplus of berries on the market. The opposite however may be observed in times of scarcity to ensure securing sufficient beans from growers. Of the total variations observed in producer price of coffee in Ethiopia, a total of about 85.96% are explained by variables specified in the equation on determinants of domestic producer price of coffee, and the joint effect of all the variables on producer price is highly significant.
3.3.3 Determinants of coffee green production (PRO)

Production of coffee green is found to be significantly dependent on yield, lagged domestic producer price, lagged world price to domestic producer price ratio, nominal rate of assistance, comparative advantage of the country in coffee (measured by the RSCA) and two-period lag of agricultural labor force. The positive coefficient of the intercept term is found significant at the 1% level, implying that, should all the other variables remain constant, Ethiopian coffee growers will continue to produce significant amounts of coffee for both domestic consumption and exports. This reflects a high dependence of growers on coffee production for sustenance.

Table 8. Determinants of coffee production in Ethiopia

<table>
<thead>
<tr>
<th>Variables</th>
<th>coefficients</th>
<th>standard error</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>16.39730</td>
<td>1.291731</td>
<td>12.69405***</td>
</tr>
<tr>
<td>ln YLDt</td>
<td>0.604442</td>
<td>0.061595</td>
<td>9.813188***</td>
</tr>
<tr>
<td>ln (WCPlt-1 /PPRt-1)</td>
<td>0.088140</td>
<td>0.037033</td>
<td>2.380039**</td>
</tr>
<tr>
<td>NRA[t</td>
<td>0.230725</td>
<td>0.121976</td>
<td>1.891552*</td>
</tr>
<tr>
<td>ln RSCAt</td>
<td>1.437157</td>
<td>0.586871</td>
<td>2.448848**</td>
</tr>
<tr>
<td>ln ALFt-2</td>
<td>-0.433864</td>
<td>0.131034</td>
<td>-3.311087**</td>
</tr>
<tr>
<td>Adj. R2</td>
<td>0.906070</td>
<td>Mean dependent var</td>
<td>12.19712</td>
</tr>
<tr>
<td>F-statistic</td>
<td>36.36954</td>
<td>S.D dependent var</td>
<td>0.148245</td>
</tr>
<tr>
<td>Prob. (F-statistic)</td>
<td>0.000000</td>
<td>S.E of regression</td>
<td>0.045434</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>42.64216</td>
<td>Sum-squared resid</td>
<td>0.033028</td>
</tr>
<tr>
<td>Durbin-Watson stat</td>
<td>2.030585</td>
<td>Jarque-Bera</td>
<td>0.051949 (0.974360)</td>
</tr>
<tr>
<td>Akaike info criterion</td>
<td>-3.099318</td>
<td>B-G LM Test (1,2): 0.044(0.837); 0.026 (0.975)</td>
<td></td>
</tr>
<tr>
<td>Hannan-Quinn criter.</td>
<td>-3.012404</td>
<td>ARCH Test, F-stat: 0.014(0.908)</td>
<td></td>
</tr>
<tr>
<td>Schwarz criterion</td>
<td>-2.753733</td>
<td>Q-stat (1,2): 0.0180(0.893); 0.0282 (0.986)</td>
<td></td>
</tr>
<tr>
<td>ADF Test of Residual</td>
<td>-4.547153***</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A unit increase in yield leads to a 0.604% increase in output, significant at the 1% level. Increase in output per unit area, reflects increased productivity of farmers’ fields and a likely increase in the number of berries per tree. Increase in number of berries per tree (in times of low incidence of diseases and pests attack) in times of increased yield would most likely result in increased volume of output. But as to whether that increase is significant was initially not known. In the current study however, it is found that a unit increase in yield leads to a significant increase in output. Therefore, to increase volume of berries supplied for both domestic consumption and export, there would be a need to increase yield. Lag domestic producer price has a coefficient of 0.092, significant at the 5% level. This implies that for every unit increase in domestic producer price in the previous year, output in the subsequent year may increase by 0.092%. Increases in domestic producer price help growers to secure more farm hands at time of harvest in the subsequent year to help minimize loss of berries, expand the current area under cultivation and to ensure effective control of shocks in the form of diseases and pests attack in their fields.

Lagged world price to domestic price ratio has a coefficient of 0.088, significant at the 5% level. This implies that for every unit increase in the price ratio, production of coffee may increase by 0.088%. Under normal circumstances, production would be expected to decrease as farmers are mostly victimized in times of increases in this ratio. Their positive response through increase in output in times of increasing world price to domestic price ratio once again affirms the high dependence of farmers on production and sales of the crop for sustenance. A decrease in tax levied on farmer’s income through increase in nominal rate of assistance stimulates growth in production, significant at the 10% level. Decrease in farm taxation means relative increase in revenue for farmers from sales of their produce. Increase in revenue for farmers offers them an opportunity to effectively meet any vital production cost, most importantly control of
diseases and pest. Increasing nominal rate of assistance also gives farmers incentives to sell their produce on the domestic market rather than smuggling it into neighboring countries. As a reflection of better conditions for production and assured market for produce, the index of competitiveness (the Relative Symmetric Comparative Advantage) has a coefficient of 1.437, significant at the 5% level. This implies that to ensure continuous growth in production of coffee, there is a need for Ethiopia to improve on its export performance, which would then translate into assured market for produce at relatively fairer price. An improvement in the country’s competitiveness as well reflects addressing of inefficiencies in the subsector and mitigation of influences that could have significant negative impacts on production.

In contrast to the initial expectation however, agricultural labor force has a significant negative association with production. This reflects inefficient use of labor available in the country. Agricultural labor force has more than doubled between the years 1981 and 2010, but not so with the low areas of coffee and other cash and food crops harvested in the country. This phenomenon subsequently triggered off ‘a flower pot law’ effect (law of diminishing marginal returns). To make better use of the increasing agricultural labor force, there is a need for area expansion in agricultural production most importantly for the coffee subsector, on which over 15 million people in the country depend for sustenance. Of the total variations observed for coffee production in Ethiopia, a total of about 90.61% are explained by variables specified in the equation on determinants of coffee production, and the joint effect of all the variables on production is highly significant.

4. Synthesis of Results and Recommendations

The current study analyzed the competitiveness of Ethiopia in its exports of coffee green. In addition, it estimated the magnitude and effects of key economics determinant of coffee green exports, producer price and production. In analyzing competitiveness of the country in its exports of coffee, three distinct periods were considered, namely, years before 1974 (1961-73 for the current study - era of the imperial regime), 1974-1991 (era of a military rule with Marxist ideological orientation) and from 1992 onwards (1992-2010 for the current study - era of a federal government system). The Revealed Comparative Advantage (RCA) and Revealed Symmetric Comparative Advantage (RSCA) measures of competitiveness were used for the analysis. Figures for the RCA and RSCA showed that Ethiopia has comparative advantage in exports of coffee green. Its performance however for the entire period (1961-2010) was found to be generally unsatisfactory.

Growth in the country’s export performance has been hindered by challenges in management of price risk\(^7\), problems with quality control, high transaction cost due to the extensive supply-chain and the numerous actors and processes therein, smuggling and unhealthy competition in both primary and auction markets, and by low productivity of growers’ fields. To enhance its competitiveness in the coffee market amidst the anticipated increase in supply-side competition in the near future, measures should be put in place to address current inefficiencies in the supply chain most importantly with management of price risk, quality control, smuggling, and transaction costs. This could be achieved to a greater extent by reducing the gap between time of purchase of the berries/beans from buyers and the time they are auctioned, setting high quality standards for the beans taken to the auction markets and placing keen watch on those that are exported without going to the auction, ensuring payment of fairer prices to growers and appropriate transmission in times of increment, and by putting in place measures to reduce the number of intermediaries in the supply chain to help minimize unnecessary competition. In addition, appropriate investment should be made in yield-enhancing innovations.

In considering the determinants of the respective strongholds (exports, producer price and production) of the coffee subsector, export of coffee was found to increase significantly with increases in lagged domestic producer price, lagged world price to domestic producer price ratio, nominal rate of assistance, foreign direct investment and exchange rate. The intercept term had a positive and significant coefficient at the 1% level, implying that *ceteris paribus*, Ethiopia will continue to export significant volumes of coffee onto the world coffee market. Export of coffee was found to decrease significantly with increases in domestic consumption. The adverse effect of consumption on export could be mitigated by increasing production at an equal rate as or above domestic consumption. Increasing output to help mitigate this effect does not necessarily translate into significant increases in export, as the coefficient of production (0.007) was found to be insignificant. Hence, we conclude that exports of coffee from Ethiopia depend much more on other internal and external factors than on production. These variables were found to explain about 63.62% of the variations observed in exports of coffee from Ethiopia and their joint effect was significant at the 1% level.

Producer price of coffee was also found to increase significantly with increases in lagged producer price, world price of coffee, exchange rate, lagged domestic consumption and lagged export of coffee. The intercept term had a negative coefficient, but was insignificant. Thus, without a significant change in any of the other variables, there would be no significant change in domestic producer price of coffee. Domestic producer price was found to decrease with

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\(^7\) Due to the volatile nature of coffee prices, both domestic and international and the wide gap between time of purchase of beans from buyers and sale of it to exporters
increases in domestic production of coffee. A total of about 85.96% of the variations observed in domestic producer price of coffee green are explained by these variables and their joint effect is highly significant.

From our study, we also discovered that production of coffee green is directly proportional to yield, lagged domestic producer price, lagged world price to domestic price ratio, nominal rate of assistance, and to increases in the country’s export performance for coffee (revealed symmetric comparative advantage). The intercept term had a positive coefficient, significant at the 1% level. This implies that, should all the other variables remain constant, Ethiopia would continue to produce significant volumes of coffee for domestic consumption and for export. Contrary to initial expectation however, domestic production was found to decrease with increasing availability of agricultural labor. This was attributed to a ‘flower pot law effect’ due to the significant increase (doubling) in agricultural labor force observed between the years 1981 and 2010, the relatively low development in area harvested of coffee compared to the rate for labor force and to the low input use nature of coffee production in Ethiopia. To make efficient use of the available labor, there is a need to put in place measures to increase current area under cultivation.

By these estimates, growth in the coffee subsector could be enhanced by putting in place measures to help increase productivity of farmers’ fields (yields), ensure continuous government support to the sector, increase competitiveness of the sector in terms of export performance and through continuous devaluation of the currency (this could however have adverse effect on sectors that rely more on imports), payment of fair prices to growers and ensuring appropriate transmission of future increments, attracting more export-oriented foreign direct investment and increasing current area under cultivation to ensure efficient utilization of the rapidly increasing agricultural labor force.

References


http://academia.edu/1015922/COMPETITIVENESS_AND_DETERMINANTS_OF_COCOA_EXPORT_FROM_NIGERIA


Other sources:

[15] IRRI. World rice statistics online query facility: exchange rate data for Ethiopia. International Rice Research Institute, 
http://ricestat.irri.org:8080/wrs2/entrypoint.htm

## Table A.1. Nominal Rate of Assistance per country

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*Source: Anderson and Nelgen (2012)*
### Table A.2. Global Performance in Coffee Green Exports

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Source: Authors’ computation with data from FAOSTAT
NB: RCA- Revealed Comparative Advantage
RSCA- Revealed Symmetric Comparative Advantage

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54
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<th>Total Agricultural exports (1000$)</th>
<th>Share of coffee green in agric. exports (%)</th>
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<td>0.52</td>
<td>5.54</td>
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<td>0.42</td>
<td>3.97</td>
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**Source:** Authors’ computation with data from FAOSTAT.

**Table A.4.** Share of coffee green exports in total agricultural exports
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<th>Country</th>
<th>Total Agricultural exports (1000$)</th>
<th>Share of coffee green in agric. exports (%)</th>
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<tr>
<td>India</td>
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<tr>
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</table>

Source: Authors' computation with data from FAOSTAT.
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