

# Macroeconomic policies and structural transformation: exchange rate management

Andualem T. Mengistu  
Ethiopian Development Research Institute

Firew Bekele  
Ethiopian Development Research Institute

**Issues Papers on Structural Transformation and Industrial Policy  
No. 011-2016**

Ethiopian Development Research Institute (EDRI)

In Partnership with:

School of Oriental and African Studies, University of London  
&  
Agence Française de Développement (AFD)

March 2016

© Copyright 2016 Ethiopian Development Research Institute; School of Oriental and African Studies, University of London; Agence Française de Développement



# Macroeconomic policies and structural transformation: exchange rate management

Andualem T. Mengistu

Firew Bekele

## A. Background

Economic growth – the sustained increase in productivity and living standards – is a target of many economic policy makers. Kuznets (1973) sates structural transformation as one of the main features of modern economic growth. Structural transformation involves a change in the distribution of employment and production across various sectors of the economy.

Much recent literature has demonstrated that economic development requires structural change from low productivity activities to high productivity activities. It also suggests that the industrial sector in general and the manufacturing sector in particular is the engine of economic growth. In fact, virtually all cases of high, rapid, and sustained economic growth in modern economic development have been associated with industrialisation, particularly growth in manufacturing production (see Szirmai (2009)).

### 1. Theoretical and empirical grounds for structural transformation

#### 1.1 Empirical reasons (stylized facts)<sup>1</sup>

There is an *empirical correlation* between the degree of industrialization and per capita income in developing countries.

One of the most prominent empirical regularities is that countries with a higher manufacturing share in GDP grow faster. Of course one may object that, this evidence, based on a cross section

---

<sup>1</sup> The empirical regularities we will discuss are liberally borrowed from Rodrik (2006).

data, may be a result of the fact that some countries have conducive economic policies and endowments that enable establishment of manufacturing and high growth. i.e., it may not be the case that manufacturing contributes to the faster growth, rather it may be the case that there is something else the countries have got that encourages manufacturing. This takes us to the second empirical regularity. The data shows that the experience of sustained fast growth in developing countries are associated with an increase in the share of manufacturing exports in the total exports and an increase in employment in the manufacturing sector.

A combination of the above two empirical observations suggests that manufacturing is a key sector for countries to experience sustained high growth. The next question then is whether manufacturing can be brought about by policy or countries are doomed to specialize in their comparative advantage. In other words, do the countries with higher share of manufacturing in their economy achieve that because they have a conducive endowment structure (e.g. abundance of labour) or do they achieve that because they have made conscious policy decisions that are conducive for the development of manufacturing?

A look at the data suggests that the latter is closer to the reality. Specifically, empirical regularities show that countries that grow fast are those that produce (especially export) goods more sophisticated than what their comparative advantage shows. In other words, a conscious policy to promote technological upgrading dictates whether a country engages in the production of a manufacturing good that facilitates its growth rate. Part of the reason why countries that produce goods more sophisticated than their comparative advantage grow faster is because that entails catching up to a higher level technology (i.e., getting closer to the technological frontier).

These empirical regularities suggest that a transition to manufacturing is likely to provide a boost to the economic fortunes of the country. One might wonder about the channels through which manufacturing provides such a growth boost. The following is a brief discussion regarding the theoretical rationale for it.

## 1.2 Theoretical reasons<sup>2</sup>

First, there is substantial data that shows that in developing countries the productivity of labor in the industrial (manufacturing) sector is much higher than the agriculture and service sectors. As a result, shifting labor away from agriculture/service towards the industrial sector provides a positive static shift effect. i.e., the country's GDP will be much higher for a given amount of labor and hours worked. This static shift effect is known in the literature as a *structural change bonus*.

Second, the data also shows that in developing countries the productivity of labour tends to grow much faster in the manufacturing sector than in the agriculture and service sectors. In other words, a country where more workers are engaged in the manufacturing sector will grow faster due to the dynamism of the sector.

Third, the manufacturing sector tends to have stronger *Linkage and spillover effects*. There are evidences in the literature that the industrial sector provides a stronger demand for the products of other sectors (backward linkage) and supplies more inputs to other sectors (forward linkage). In addition, the manufacturing sector has traditionally been the sector where most new products and processes get developed. In other words, most sectors adopt new technologies and processes that originate from the manufacturing sector. To put it in an economic jargon, the manufacturing sector has stronger spillover effects (knowledge externalities).

Fourth, the manufacturing sector usually requires lumpy investments. This characteristic of the industry has two implications. The first implication is that production in the sector offers economies of scale, i.e. increased productivity as more is produced. The large-scale production that results from the effect of economies of scale will further provide opportunities for learning by doing. In other words, production in the industrial (manufacturing) sector provides both

---

<sup>2</sup> Most of the discussion regarding theoretical justifications provided below relies on Szirmai(2009)

static gain (economies of scale) and dynamic gain (growth of productivity through learning by doing). The second implication of lumpy investment in the sector is that the sector provides more opportunities for capital accumulation.

Finally, there is the effect of the famous Engel Law. Engel Law, which stands the taste of time in its empirical validity, states that as per capita incomes rise, the share of agricultural expenditures in total expenditures declines and the share of expenditures on manufactured goods increases. One consequence of this observation is that the expanding world market that results from economic growth provides a much larger market for manufacturing goods than agricultural commodities. As a result, countries that produce manufacturing goods are better positioned to benefit from this growth in the global economy.

## 2. What Kind of Manufacturing (import substitution vs. Export Orientation)<sup>3</sup>

Most of the empirical literature assessing the relationship between exports orientation and growth is inconclusive. Specifically, the problem of endogeneity has made it nearly impossible to identify the causal relationship between export orientation and growth. However, there are some strong theoretical reasons to suspect that export oriented manufacturing serves as an engine of growth much more than an import oriented one.

Specifically, there are three channels through which export orientation furthers growth better than import substitution orientation.

First, as we have stated above investments in manufacturing tend to have economies of scale. One implication of this nature of the technology is that firms will only be able to sell at competitive prices (i.e. have lower costs) if they are able to produce sufficiently large quantities. The same applies to their ability to benefit from learning by doing. But the domestic market of most developing countries is limited in terms of the amount of demand it can generate for

---

<sup>3</sup> We borrowed the ideas for this paragraph from Ari Kokko (2002).

manufactured goods. Export orientation, by providing unlimited global demand, will support the growth of competitive manufacturing firms.

Second, industrialization at an early stage relies on imports of capital and raw materials from the rest of the world. If sufficient numbers of firms in the country do not engage in export, then a country that strives to industrialize will run in to balance of payment problems. Similarly, if a country is to promote industrialization, it needs to invest on supporting infrastructure. But the fund for these investments, at least partially, comes from external borrowing. These loans will only be paid back if sufficient foreign exchange can be generated through export.

Third, the experience of the Asian-miracle countries shows that industrial policy plays a significant role in the growth of the sector. These policies involves several 'carrots' such as credit subsidy, import tariff, export subsidy, etc. If firms are left to their devices under the protection of these policies, they may not be able to develop the required competitiveness. Therefore, export orientation by exposing firms to tougher international competition, serves as a discipline mechanism to improve their productivity.

In summary, the literature provides strong empirical and theoretical justifications regarding the growth enhancing impact of transformation from agriculture to export oriented manufacturing. In addition, there is significant literature documenting how this transformation may not be automatic and need supporting industrial policies. Among the reasons (justifications) for industrial policy are the presence of coordination failures, knowledge spillovers, and information externalities.

Given the desirability of the structural transformation and the barriers that may limit the speed, countries have adopted various policies under the general umbrella of industrial policy. Relevant for our current purpose is the conventional wisdom that macroeconomic policies create an enabling environment for industrial policy. Based on that argument macroeconomic policies- tax incentives, infrastructure spending, financial market rules and regulations,

monetary policy, exchange rate policy- have been deployed in various countries as part of the industrial policy package.

Since some of these macroeconomic policies, their justifications, and empirical impacts have been addressed in the other issue papers contained in this compendium, this paper limits itself to a review of the theoretical arguments and empirical evidences on the merits and demerits of the deliberate strategy of maintaining the exchange rate at disequilibrium in order to promote industrial transformation.

## B. Exchange rate management

The literature on the relationship between exchange rate movements and growth in general and the performance of the industrial sector in particular can be broadly divided in to two: Macro and Micro.

The macro based literature estimates the impact on growth and/or the performance of the industrial sector of the under/over valuation of the real exchange rate of a country's currency. The consensus in this strand of the literature is that real exchange rate appreciation is associated with slow growth of the economy. Johnson, Ostry, and Subramanian (2007) for instance finds that one factor that may explain the difference in growth of countries in East Asia and most of the countries in Sub Saharan Africa is that the former have managed to avoid sustained periods of real exchange rate overvaluation. Nonetheless, some countries still fail to avoid overvaluation their currencies.

In his seminal work, Rodrik (2008) goes further and shows that periods of undervaluation are associated with higher growth. In addition, he finds that undervaluation of the real exchange rate is associated with better performance of tradable sectors in general and the industry sector in particular. Furthermore, his result suggests that this relationship holds only in developing countries. The proposed channel is that the tradable sector suffers more from low quality institutions and undervaluation serves as a second best policy.

Haddad and Pancaro (2010), in line with Rodrik, argue that the effect of undervaluation of the real exchange rate on growth and the performance of the export sector are positive. In addition, this effect only holds true in developing countries. However, they also find that this effect is short lived. In particular, the long run impact of undervaluation on the performance of the export sector is insignificant and its impact on growth may even turn out to be negative.

The discussion above underlines the fact that the macro literature on the relationship between growth and real exchange rate is conclusive on the detrimental effect of overvaluation. On the other hand, it does not provide a clear-cut answer on whether a country can utilize undervaluation as a tool in its industrial policy package. If any thing, it points to a beneficial role for aligning real exchange rate to its equilibrium level.

The macro literature focuses on making distinction between the tradable and non-tradable sectors to explain why undervaluation is positively correlated in developing countries. In particular, Rodrick (2008) argues that the tradable sector suffers disproportionately from institutional weakness. He also argues that the tradable sector suffers disproportionately from market failure. Hence, a policy that improves the relative price of the tradable sector will be the second best policy to improve growth. Rodrick (2008) also argues undervaluation has positive effect on industrial tradable sector, but it does not have positive impact on the agricultural tradable sector.

The macro literature relies on cross country regression or very aggregated sectoral definitions (exporters vis-à-vis importers, industry vis-à-vis agriculture, etc). The result has been that it is harder to disentangle the channels through which the movement of the real exchange rate affects the performance of the economy in general and the sectors in particular.

The micro based literature addresses this challenge. Specifically, it attempts to study how the impact of exchange rate movements differ based on the various characteristics of firms using firm level data. One common characteristic of this strand of the literature is that it does not rely



on the concept of undervaluation or overvaluation to examine the differential performance of firms. As such it avoids the difficulty associated with measuring the equilibrium real exchange rate. Rather, the literature relies on the different impact on firms of the change in real exchange rate (i.e. depreciation vis-à-vis appreciation).

Below, we discuss some of the papers that have examined whether the impact of an exchange rate fluctuation is heterogeneous depending on firm characteristics.

Verhoogen (2008) looks at the effect of the 1994 Mexican Peso devaluation on Mexican firms, and finds that larger, more productive firms who were initially exporting increased production and raised wages after the devaluation relative to smaller, less productive firms. The mechanism he proposes is quality upgrading: firms that were able to take advantage of the improved exporting environment did so by increasing the quality of their labor input.

Chaney (2013) presents a model that examines the effect of an exchange rate appreciation in an economy that faces liquidity constraints. In the model, when the exchange rate appreciates, existing exporters become less competitive abroad, but at the same time, firms that have assets abroad are able to unlock liquidity through an increase in the value of those foreign assets, and subsequently increase investment. So the net effect of the appreciation on exporter production is uncertain, and could even be positive for firms that unlock lots of asset value abroad.

Fitzgerald and Haller (2014) note that net exports have been shown to be more responsive to trade liberalizations than they are to real exchange rates, and go on to document that real exchange rate fluctuations had very little effect on both the extensive (participation) and intensive (revenue) margin for Irish exporting firms.

In sum, Verhoogen (2008) examines the labor input channel, Fitzgerald and Haller (2014) examine the firm-age channel, and Chaney (2013) suggests differential impacts of a currency

fluctuation on firms based on the nature of the financial market, but does so without any data to back up his theoretical model.

The above literature examines how real exchange rate movements affect the firms' export amount, their profitability, and production.

A related literature in international trade (see Trefler (2004), Lileeva and Trefler (2010), Bustos (2012), and Verhoogen (2008)) stresses that increased exporting is associated with increased firm-level TFP growth and improvements in industry-level productivity. However, recent work in trade has also documented that cheaper access to imported inputs is also associated with firm-level TFP growth, as documented in Goldberg, et al (2010), Kugler and Verhoogen (2012), Laszlo, Halpern and Szeidl (2011), and Amiti and Konings (2007).

The combination of these two observations implies that real exchange rate movement may have two competing effects and which one dominates is an empirical question. Specifically, real exchange rate depreciation may lead to more export and increased productivity. On the other hand, real exchange rate depreciation may lead to an increase in the cost of inputs and decreased productivity.

### C. A path forward and Policy Relevance

In this section we attempt to bring the whole analysis above to its main purpose. In particular, we see two main areas of focus that may be of great relevance to the literature and policy making in Ethiopia.

First, a look at this strand of the literature suggests dearth of studies using firm-level data that empirically document how a devaluation affects heterogeneous firms differentially based on where they source their inputs from, and where they sell their products. Additionally, we have

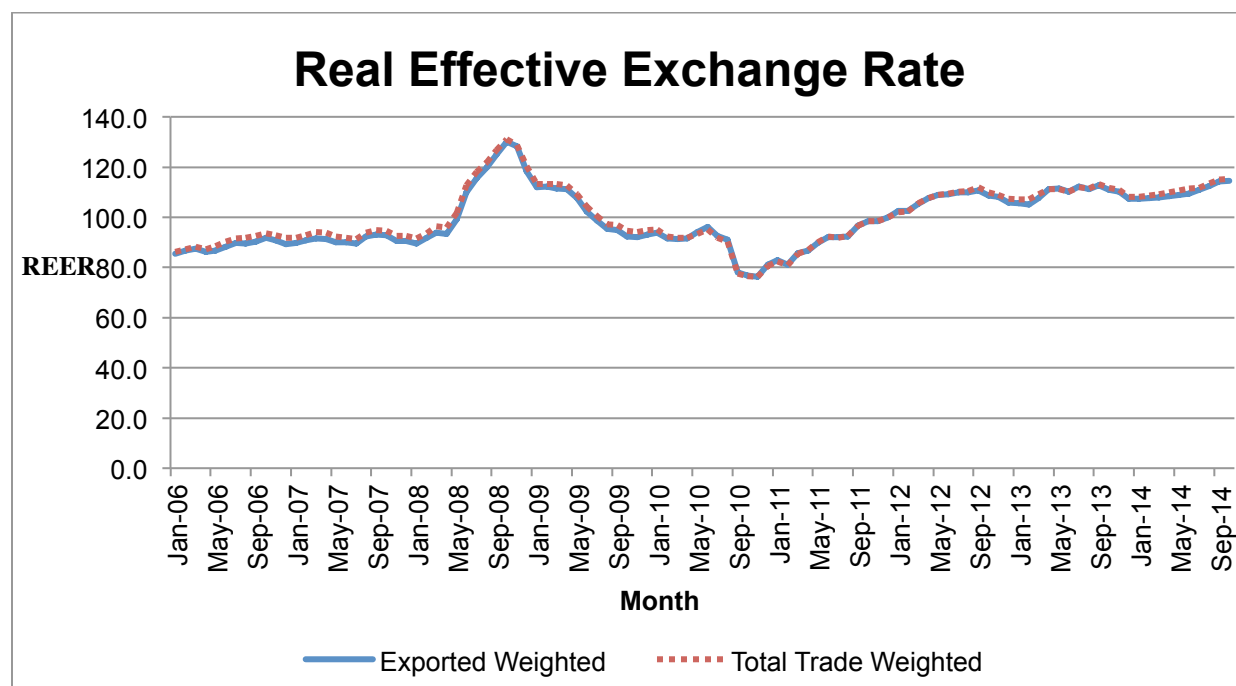
not found any papers that document how currency devaluation affects firms in a country with a very low industrial base, like Ethiopia.

Second, a look at the recent macroeconomic trend in Ethiopia (figure 1) shows that the real exchange rate has experienced significant appreciation between 2008 and 2009. Policy makers react to this development, in line with the macro literature, by devaluing the currency by 16% in September 2010. After a brief lull, the real exchange rate has appreciated back to almost its previous pick. Similar to the previous episode, and in line with the macro literature, policy makers are receiving the same advise (devaluation) from international institutions.

One would think that both the previous devaluation and the call for new one will be based on a careful empirical documentation of the differential impact of the move on different firms and how that aligns with the strategy of the government. However, a search for these documents doesn't turn up any thing. Specifically, there is no paper systematically documenting how the devaluation affected the export quantity, profit, and productivity of various firms.

The study currently being undertaken by Segura, Eduardo, and Andualem (upcoming) using the census data on the manufacturing firms of Ethiopia attempts to asses the differential impact on firms of the 2010 currency devaluation in Ethiopia and therefore partly addresses the above mentioned gaps. Specifically, it will contribute to the literature by examining how the impact of the devaluation depend on where firms get their inputs from and supply their product to. It also will contribute to the concern of policy makers and help them anticipate the impact of future devaluations by examining the impact the 2010 devaluation had on firm performance.

**Figure 1: The trend in Real Effective Exchange Rate in Ethiopia**



## References

Adam Srizmai (2009), "Industrialization as Engine of Growth in Developing Countries," UNU-Merit working papers

Amiti, Mary and David Weinstein, "Exports and Financial Shocks," *Quarterly Journal of Economics*, 2011, 126 (4), 1841–1877.

Amiti, Mary and Jozef Konings, "Trade Liberalization, Intermediate Inputs, and Productivity: Evidence from Indonesia," *American Economic Review*, 2007, 97 (5), 1611–1638.

Ari Kokko (2002), "Export-Led growth in East Asia: Lessons for Europe's transition economies," EIJS working paper No. 142.

Bustos, Paula, "Trade Liberalization, Exports, and Technology Upgrading: Evidence on the Impact of MERCOSUR on Argentinian Firms," *American Economic Review*, 2012, 101 (1), 304–340.

- Dani Rodrik (2006) "Industrial Development: Stylized Facts and Policies," Harvard University.
- Dani Rodrik, 2008. "The Real Exchange Rate and Economic Growth," *Brookings Papers on Economic Activity*, Economic Studies Program, The Brookings Institution, vol. 39(2 (Fall)), pages 365-439.
- Davison, William, "Ethiopian Central Bank Says Devaluation to Boost Exports, Domestic Output," September 2013. Bloomberg News.
- Goldberg, Pinelopi Koujianou, Amit Kumar Khandelwal, Nina Pavcnik and Petia Topalova, "Imported Intermediate Inputs and Domestic Product Growth: Evidence from India," *The Quarterly Journal of Economics*, 2010, 124 (4), 1727–1767.
- Halpern, Miklos Koren Laszlo and Adam Szeidl, "Imported Inputs and Productivity," CeFiG Working Papers 8, 2011.
- Kugler, Maurice and Eric A. Verhoogen, "Prices, Plant Size, and Product Quality," *Review of Economic Studies*, 2012, 79, 307–339.
- Lileeva, Alla and Daniel Trefler, "Improved Access to Foreign Markets Raises Plant-level Productivity...For Some Plants," *Quarterly Journal of Economics*, 2010, 125 (3), 1051–1099.
- Matsuyama, Kiminori, 1992. "Agricultural productivity, comparative advantage, and economic growth," *Journal of Economic Theory*, Elsevier, vol. 58(2), pages 317-334, December.
- Nouira, Ridha & Plane, Patrick & Sekkat, Khalid, 2011. "Exchange rate undervaluation and manufactured exports: A deliberate strategy?," *Journal of Comparative Economics*, Elsevier, vol. 39(4), pages 584-601.
- Simon Johnson & Jonathan D. Ostry & Arvind Subramanian, 2007, "The Prospects for Sustained Growth in Africa: Benchmarking the Constraints," *NBER Working Papers 13120*, National Bureau of Economic Research, Inc.
- Trefler, Daniel, "The Long and Short of the Canada-U. S. Free Trade Agreement," *American Economic Review*, 2004, 94 (4), 870–895.
- Verhoogen, Eric, "Trade, Quality Upgrading, and Wage Inequality in the Mexican Manufacturing Sector," *The Quarterly Journal of Economics*, 2008, 123 (2), 489–530.