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# Unpacking state-led upgrading: empirical evidence from Uzbek horticulture value chain governance

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## ABSTRACT



This paper brings together the Global Value Chain/Global Production Network (GVC/GPNs) and the Developmental State (DS) literature to analyze state-led upgrading. By triangulating primary and secondary data on Uzbekistan's horticulture value chain, it provides a micro-meso analysis of how the state, by creating vertical and horizontal linkages, shaped the pace and direction of agro-industrial upgrading. It discusses how targeted macroeconomic policies enabled upgrading and argues that the state should be seen not only as a regulator, facilitator, buyer and producer within GVC/GPNs, but also as a coordinator of strategic developmental objectives beyond and across the GVCs. Drawing on a strategic-relational approach and using the concept of *organisational upgrading*, it shows how the state articulates the institutional context of GVC/GPNs through the establishment of financial and political partnerships with international actors to avoid predatory competition; the coordination of inter-sectorial spillovers for short and long-term collective learning and capacity building; and the creation of linkages to enable multi-dimensional and inter-temporal developmental objectives. Coordinated state interventions and a gradual approach to market reforms were instrumental in ensuring the sustainability of the economic transformation.

## KEYWORDS

state; upgrading; governance; industrial policy; trade; agri-business; GVC/GPN

## 1. Introduction

Despite diverse theoretical perspectives, economic upgrading has been identified as a desirable objective that developing countries should focus on to promote their growth (Gereffi, 2014; Lee, 2013; Wade, 2018). Economic upgrading is defined as a shift to higher productive value-added activities, resulting from improved access to, and use of, technology, knowledge and skills (Barrientos et al., 2011; Selwyn, 2013). Humphrey and Schmitz (2004) identified four types of economic upgrading: product-related; process-related; functional (skill-related) and inter-sectorial. This article, building on the growing debate on the role of the state in GVC/GPNs (Alford & Phillips, 2018; Behuria, 2019; Gereffi, 2015; Horner, 2017; Horner & Alford, 2019),

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and combining it with the Developmental State (DS) literature (Chang, 2004; Cramer, 1999; Wade, 2003; 2018) expands the understanding of the role of the state vis-à-vis upgrading in GVCs in three ways.

First, although agriculture has often been identified as a strategic sector for triggering development in low- and middle-income countries (WB, 2007), research on upgrading has focussed mostly on manufacturing (Gibbon, 2001). This paper, through micro-meso evidence, shows how inter-sectorial upgrading represents a viable driver of development and how the state can create specific spillovers between the agricultural and industrial sectors.

Second, it strengthens the empirical understanding of the *state's functions* as conceptualised in the GVC/GPNs literature (Gereffi, 2013; Horner, 2017; Mayer & Phillips, 2017), namely as a *facilitator* (i.e. assisting firms in the market), *regulator* (combined with *distributor*; i.e. mitigating inequality and negative market externalities), *buyer* (i.e. public procurement) and *producer* (i.e. state owned companies). This article analytically links them with the 'developmental' macroeconomic policies—innovation, public finance, trade, and industrial policy—investigated in the more state-centric developmental state (DS) literature. It argues that a closer interface between these two parallel debates provides an understanding of how state governance in GVC/GPNs can be operationalised through public policies, and how it can trigger multiple forms of upgrading in, to, and from agro-industrial value chains.

Third, by expanding the political economy analysis of the state's functions (Horner, 2017) and bridging micro- and macro-level evidence, it introduces the concept of 'organisational upgrading', defined here as a state-led coordination strategy able to link economic upgrading in GVCs with developmental objectives. Organisational upgrading emphasises the state's unique *strategic-relational* (Jessop, 2008; Smith, 2015) and *multi-scalar* (Lee, 2013) mandate to mediate inter-temporal developmental objectives *beyond* economic upgrading in GVCs.

The article is structured as follows: the next section reviews the literature on the challenges of upgrading and the role of the state in the GVC/GPNs governance. Section Three discusses the Uzbek agricultural policies and puts forward a micro-meso analysis of state-led agro-industrial upgrading. Section Four presents and critically discusses the macroeconomic interventions for the Uzbek FFVs value chain upgrading. Section Five highlights the multidimensional outcomes of economic upgrading and discusses how *organisational upgrading* configured socio-economic objectives in and out the GVCs. Section Six concludes the article by highlighting that coordinated state interventions, through a gradual approach to market reforms, are crucial for ensuring the stability and sustainability of the economic transformation processes.

## 2. Challenges of and possibilities for state-led upgrading

Although economic upgrading is a significant driver of economic development, various constraints affect its success. Upgrading depends firstly on the expansion of technological, human, and financial capacities to produce added-value commodities (Chang, 2004). Secondly, it depends on the ability to enter new GVC/GPNs and survive international competition over price, quality, volume and reliability through the capture of market shares, value, and compliance with certification schemes

(Dolan & Humphrey, 2004; Gereffi, 2014). Thirdly, it depends on how well coordinated are the development (and management) of vertical and horizontal spillovers<sup>1</sup> (Hirschman, 1958; Wade, 2018). Thus, a centralised agent that is able to plan and organise complex socio-productive dynamics within the chain is crucial, not only to trigger upgrading but also to maintain this process once it begins.

The GVC/GPNs literature focused largely on private governance to understand the processes and challenges of upgrading in the era of neoliberal globalisation (Gereffi, 2014; Horner, 2017). Given the Multinational Corporations (MNCs)' hegemonic position in the market, the GPNs/GVC literature devoted much attention to the ability of MNCs to maintain control over the technological, financial and commercial flows involved in GPNs/GVC through private governance (Dicken, 1994; Dolan & Humphrey, 2004; Selwyn, 2013). Similar to other labour-intensive industries, the agro-industrial chain is often characterised by buyer-driven captive governance (Barrientos et al., 2016; Gereffi et al., 2005), where transnational private retailers apply strict private quality standards and exploitative sub-contracts with farmers. The result is often little or no horizontal or vertical spillover effects for skills and capability transfers in low-income countries (Bair, 2005; Barrientos et al., 2016; Humphrey & Memedovic, 2006). However, as Bair stated, "closer attention to the larger *institutional* and structural environments in which commodity chains are embedded is needed in order to inform our understanding of the social and developmental dynamics of contemporary [capitalistic growth]" (2005:154).

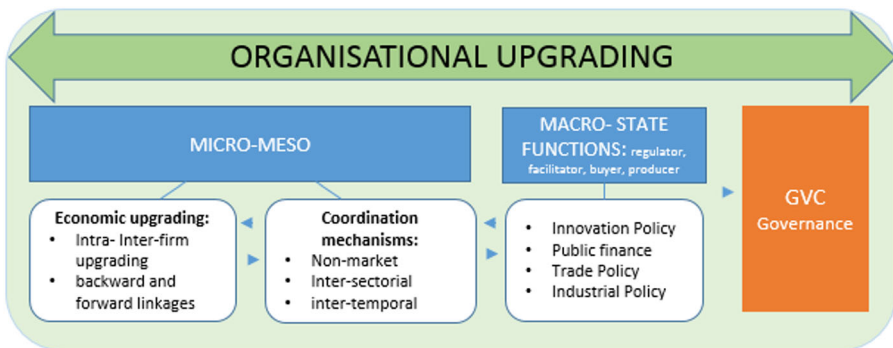
The DS literature, which is more focused on national industrial policy, has challenged the axioms of mainstream debates on the central role of the *state* (as opposed to private agents) in triggering upgrading. Authors argued that state intervention does not lead to efficiency losses, distortions, and poor economic performance (Krueger, 1997; Schiff & Valdes, 1992; WB, 2007). On the contrary, it argues that it is crucial for financial investments, implementing strategic inter-sectorial policies, and spurring systemic learning to trigger development (Andreoni, 2019; Chang, 2004; Hausmann & Rodrik, 2003; Hirschman 1954; Mazzucato, 2013; Rodrik, 2004; Wade, 2003; 2014). Indeed, because the 'laissez-faire' paradigm failed in its mission of creating successful pathways to development (Rodrik, 2004), starting with the post-Washington Consensus, the role of the state regained some legitimacy in the development agenda; more attention is now paid to empirically investigating how state policies can trigger economic upgrading and developmental outcomes while capturing value from GVC/GPNs.

Indeed, recent works, many of which appeared in the *Review of International Political Economy*, started untangling the state's multiple *functions* in GVC/GPNs. Some authors classify these functions as *facilitative*, *regulatory* and *distributive*, and examined how neoliberal reforms outsourced these governance functions from the state to the market (Alford & Phillips, 2018; Gereffi, 2013; Mayer & Phillips, 2017). Horner (2017) added the functions of *buyer* and *producer*, noting that the state is actually an active economic agent in the GVCs. Behuria (2019) recently integrated these functions with the political settlements framework to show that domestic politics shaped the upgrading of Rwanda's coffee value chain. Wengle (2018) also shows that in the post-Soviet region, countries like Armenia and Russia have pursued state-led developmental strategies in rural and agrarian sectors. These important contributions signal the crucial need to further disentangle the

multidimensional role and context-specificity of public governance in economic upgrading within GVC/GPNs (Behuria, 2019; Horner & Alford, 2019).

Yet, further work is needed to unpack the role of the state *within* and *beyond* these functions. Indeed, the state strategically selects, mediates, and coordinates local capabilities, financial resources and societal objectives through different non-economic functions *on*, *off* and *between* GVCs. Also, private agents cannot be de-contextualised from the social relations—including with the government—that shape production and exchange with the GPNs (Barrientos et al., 2016). Nor can they be separated from the contextual *institutional strategies* and *organisational forms* through which private and public goods and services are produced, sold, and regulated by the state. The concept of ‘organisational upgrading’, namely the state-led continuous (*ex-ante*, *in-itinere* and *ex-post*) configuration of coordinated strategies that link economic upgrading with developmental objectives, tries to make explicit the relationships among these ontological categories in three ways.

First, it highlights the fact that the state operates through non-market, inter-sectorial, and inter-temporal mechanisms at the micro-meso-level and beyond the GVC/GPNs (Andreoni, 2019; Ponte & Sturgeon, 2014:17). Second, it helps to explain how state governance functions play out through context- and time-specific macro-economic policies that enable economic upgrading. Finally, it shows that inter-scalar state-led coordination not only fosters a ‘sound’ business environment and productive capabilities for the establishment of GVC/GPNs linkages (Gereffi, 2014; Horner,



**Figure 1.** Organisational Upgrading.  
Source: Author

2017; Ponte & Sturgeon, 2014), but also encompasses societal *developmental* outcomes outside the GVC/GPNs (Figure 1).

Hence, organisational upgrading is a conceptual tool that can underscore and assess whether public governance can be an alternative to the private buyer-led governance, and whether it is able to organise developmental governance that can help domestic agents and firms capture value and power within the GVC/GPNs (Fishwick, 2019; Gereffi, 2014; Ponte & Sturgeon, 2014), as well as societal benefits in and outside the GVC/GPNs.

This discussion draws on primary and secondary data from the agro-industrial sector that was gathered through fieldwork research from August 2015 to January 2016. 16 unstructured interviews were conducted with key national stakeholders

to chart the institutional settings and policies on upgrading. Also, a stratified farmer survey of 120 units was conducted in Samarkand. Among its aims was to assess differentiation in assets, commercialisation, and linkages with agro-firms. Samarkand was chosen because the Government of Uzbekistan (GoU) is investing enormously in FFVs, as it is one of the country's most fertile areas. The sampling criteria aims to compare and contrast FFVs and non-FFVs, namely 30 cotton/wheat farmers, 30 FFVs farmers, and 60 smallholders, and drew on previous data collection exercises (Petrick & Djanibekov, 2016). Additionally, participant observations and semi-structured interviews were conducted at two firms in the Samarkand region, one a major FFVs consortium and the other an agro-processing firm. The aim was to grasp firm-level business operations, upgrading, and procurement challenges. Archival research consisting of publicly available company data, news articles, national data, and reports helped to map and investigate the organisational and coordination dynamics of the institutions involved. Although international organisations suggest treating official national statistical data with caution, they have been used to grasp the main trends.

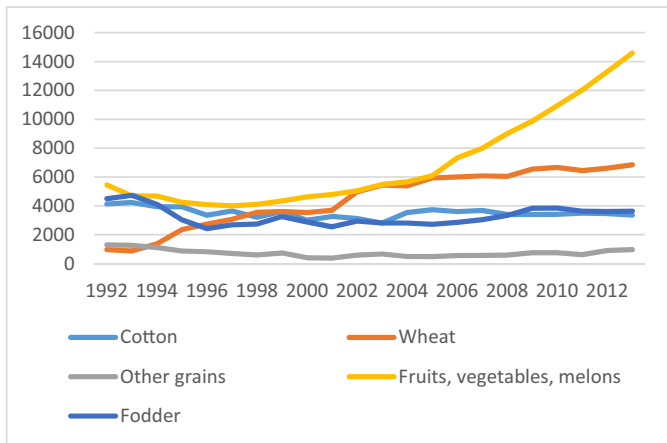
The following section discusses the Uzbek agricultural policies and offers a micro-meso analysis of agro-industrial upgrading.

### **3. Uzbek state-led agro-industrial upgrading**

While Uzbekistan is often described as an authoritarian state (see Djanibekov et al., 2010; Lombardozzi, 2018) it is also pursuing developmental policies, a fact that is often neglected. Through a model based on 5-year economic planning, the GoU developed a coordinated ecosystem of inter-sectorial public investment, strategic state-ownership, targeted subsidies and heterodox-expansionary macroeconomic policy. These targeted interventions contributed to make Uzbekistan one of world's fastest growing countries of the past few decades; its GDP growth was steady at around 8 per cent (WB, 2015), with good prospects for the next 10-20 years. Moreover, after two decades of economic and political closure, it has adopted an outward-looking strategy—one that intensified after president Shavkat Mirziyoyev took office in 2016. Therefore, Uzbekistan represents an interesting case of state-led capitalism and has been selected because, although under-investigated, it offers an insightful example of how the state, by proactively interplaying with local and international economic interests and powers, has shaped GVC/GPNs upgrading while mediating domestic societal and political objectives.

In this pattern of structural transformation, the contribution of agriculture to GDP has declined from 28 per cent to 17 per cent in just a decade. And yet, similar to other lower middle-income countries, it still employs around 25 per cent of the labour force while nearly 60 per cent of the population – 17 million people – still live in rural areas (Djanibekov et al., 2010; Staritz & Reis, 2013). Therefore, the agricultural sector is considered a key driver of economic upgrading (Lombardozzi, 2019) in which the state actively intervened through a set of strategic and coordinated policies.

The national agrarian reforms can be separated into three main stages. First, after gaining independence from the Soviet Union in 1991, the GoU placed unprocessed cotton for export at the core of agricultural production. This strategy allowed the GoU to acquire foreign exchange due to its centrally managed



**Figure 2.** Production of different crops (MT).  
Source: FAOSTAT

procurement system. Second, in the late 1990s, the GoU undertook an initial crop diversification manoeuvre consisting of an increase in winter wheat and a reduction of 1.1 million hectares of cotton to increase grain supply (WB, 2015). This state intervention improved domestic per-capita grain availability and food security. Third, in the early 2000s, the GoU invested in a further reconfiguration of agricultural production towards FFVs. This crop conversion was incentivised by issues linked to water scarcity and low cotton yields (Petrick & Djanibekov, 2016) and by Uzbekistan's comparative advantage in labour-land ratio (see Figure 2).

Indeed, the GoU recognised the high developmental potential of FFVs for inter-sectorial upgrading, as they have a market value of between two and four times that of cotton and wheat (Center for Economic Research – UNDP, 2017b; WB, 2015) and are an important input for agro-processing firms. This objective was embedded into the national '*Programme of Measures to Expand and Develop the Food Industry*' for 2012-2015 (FAO, 2014), aimed at improving the conditions for inclusive growth in rural areas, enhancing food security, and creating productive employment with decent wages for the poorest in rural areas (Altenburg, 2011). The GoU's socio-political objective was to create jobs in the sector, while also contributing to the diversification of the economy and to the expansion of exports. Hence, given the intersecting social, political and economic goals attached to the FFVs value chain, it provides an insightful lens to explain organisational upgrading. Before exploring that in detail in Section 5, I will now investigate how and why, by enabling 'strategic coupling' between institutional and productive agents at the micro-meso level (Lee et al., 2014), the state triggered agro-industrial upgrading through the FFVs value chain.

### **3.1. State-led upgrading through horizontal and vertical linkages: micro-meso evidence**

The government, by acting as an inter-sectorial and inter-scalar mediator (Lee et al., 2014), has spurred intra- and inter-firm linkages. Based on participant observations in two agro-firms in the Samarkand region and on semi-structured

interviews, I discuss how and why micro-meso level state interventions triggered the Uzbek agro-industrial upgrading and, by creating backward and forward linkages, enabled economic development.

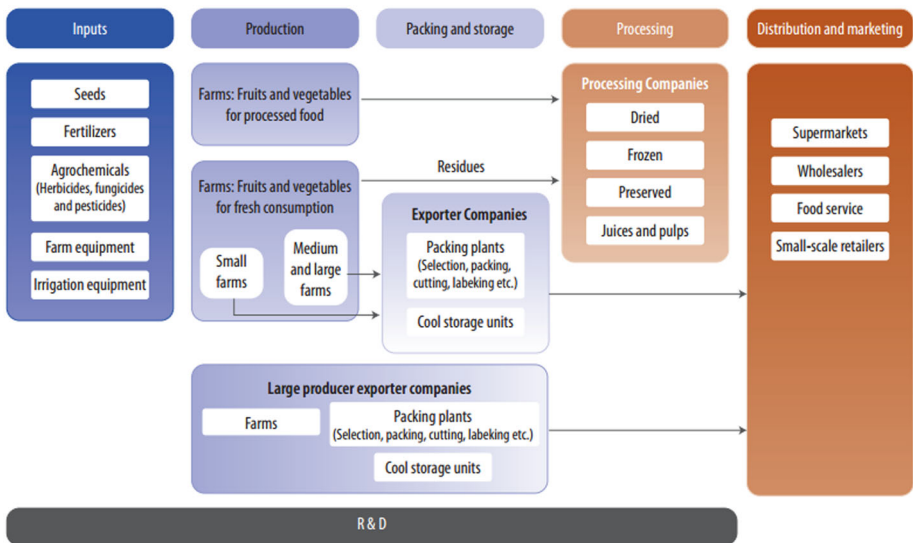
Okhalik Oltin Boghi Mevasi, a public-private consortium that covered 680 hectares producing FFVs, was established in 2008 because of the state's multiple roles as *facilitator*, *regulator*, *buyer* and *producer* (Horner, 2017; Mayer & Phillips, 2017). Initially, the state financed investment in the intensive gardening of plums, apples and peaches, which enabled the acquisition by the consortium of high-yield seedlings from Ukraine, Serbia and other European countries. Because these investments were at first subject to slow but increasing marginal returns, they could only be implemented through public 'patient capital', rather than through a scarce and 'anxious' private capital.<sup>2</sup> Second, through state-subsidised credits, the consortium was able to invest in drip irrigation (propylene tubes), an expensive water-saving technology, which enabled technological and process upgrading. Additionally, the GoU facilitated the acquisition of more expensive international brands (e.g. Syngenta and Bayer) which increased the productivity of the harvest. Third, and as a result of the expansion of more sophisticated production cycles, this state-led initiative created a demand for high-skill labour such as managers, agronomists and chemists. Fourthly, the GoU facilitated the import of machinery for grading and differentiating harvested products from specialised companies such as Italy's Unitec, which has facilitated the in-house development of sub-marketization activities.

However, during fieldwork it was noted that when harvests were lower than expected, grading machines were not activated and the grading process was executed manually by low-wage and unskilled labour, typically young women. That is because labour is cheaper than the cost of the electricity required to operate the machines. This instance is crucial for understanding the market constraints on technological upgrading and why state intervention is useful. Indeed, in a developing context, expensive energy prevents full-capacity utilisation of the existing technology in the sector, leading to inefficiency. As long as rural wage levels are very low, manual labour has a competitive advantage over the implementation of technology. Thus, being in a position of oligopsony for labour demand, existing firms have no incentive to systematically use the technology. Calculations based on interviews with farmers show that agro-firms employ four permanent workers per hectare on average, plus an additional four fruit pickers per hectare in the harvest season. Figures show that the overall demand for unskilled and skilled wage-labour in the FFV agro-sector, estimated at 300,000 units in 2015, is still scarce and unable to absorb the current active workforce (estimated at 2 million people in the Samarkand region) despite the presence of other industries like tourism and services. Therefore, at the beginning of the catch-up process, considering that supply rarely creates its own demand, public expenditure can compensate for the high cost of upgrading through the creation of complementary sources of (public) demand for technology (Chang, 2009). This case study shows that the given factor endowments, namely a relative abundance of cheap labour and agricultural land per-capita, have been channelled by state and public capital into the transformation of the agro-industrial sector. Given the overwhelming supply of cheap labour alongside capital scarcity in rural areas, large-scale interventions have used public finance to invest in capital-intensive technology in a context where, similar to many developing countries, the initial costs are too high for private domestic



investors and too risky for foreigners. Although the use of technology is disrupted and under-utilised in the short-run, public interventions enabled long-term positive outcomes for both employment creation and wage levels. By subsidising the initial demand for technology, such short-run inefficiencies will be countered in the long-run because it is expected that the domestic nodes of the value chain will expand and the relative fixed costs of technological inputs over labour will decrease due to the creation of more employment.

Thanks to the state-led set of investments and credits, the GoU was able to expand the human capacity, availability, and use of technology to upgrade processes of production. According to survey data, the result was that farmers managed to increase their earnings because they could sell the best fruits at a price four times higher—namely one USD per box—by diversifying their sale away from local markets and agro-processing and towards international markets. However, the state was not only directly involved in product, process and functional upgrading through mixed-ownership, but also indirectly by stimulating and facilitating the development of a private-led ‘industrialization of freshness’ (Cramer, 2015), namely washing, chopping, bagging, packaging and branding (Humphrey & Schmitz, 2004). This led to the deepening of production diversification and inter-sectorial



**Figure 3.** The agro-industrial upgrading.  
Source: Duke CGGC

upgrading (Figure 3).

Agromir is an interesting case study within the private agro-processing sector because it helps to explain the role of the state in the process of inter-sectorial upgrading. Agromir established one of its plants in Samarkand in 2010, producing industrial foods such as fruit juice, concentrates and paste, pickled and canned vegetables, and marinated products. Although some raw commodities are produced through vertical integration, most of FFVs inputs are sourced from local farmers in the Samarkand region, the Fergana valley and Surkhandarya. Interviews with farm

managers and local administrators confirm that the local government (*hokimiat*) coordinates an annual, three-party ‘triangle’ procurement contract that includes the supplier, the processing company, and the state through the local administrator. Under these contracts, the local government acts as a guarantor for the farmers who receive a guaranteed fixed price and as an ‘institutional market mediator’ to smooth out transactions between farmers and processing companies.

These state-led vertical spillovers between local FFVs suppliers and contractors (agro-processing firms) have also been crucial in upgrading the domestic agro-business value chain and its integration into GPNs by facilitating the creation of backward linkages. Agribusiness managers confirmed that securing inputs from local suppliers helped them avoid risky exposure to international price volatility. It has also reduced transportation costs and import dependency. Those linkages occurred through state interventions which, by also facilitating the provision of technology necessary to produce FFVs, (i.e. affordable and specialised machinery, tools, fertilisers, high-yield seeds, irrigation systems and credit), enhanced the quantity and quality of FFVs supplied to the agro-industry by national farmers. Furthermore, survey data show that FFVs farmers who engage with processing companies have on average higher technological endowments (input index i.e. tractors, high-yield seeds, fertilizers, irrigation) and asset index (household assets such as car, fridge, cows etc.) than farmers who produce cotton and wheat and do not engage with agro-processing companies (Table 1). This could also be linked to the positive effect of trading with technologically endowed companies. Indeed, interviews with FFVs farmers show that they prefer to sell to agribusinesses than to local bazaars because the former offer more stable, although some-

**Table 1.** FFVs farmers vs. non-FFVs farmers Input and Asset index.

	Input index	Asset index
FFVs farmers	8.8	5.5
Cotton-wheat farmers	7.3	3.4

Source: Author’s survey.

times unfavourable, prices and contracting arrangements.

Around US\$40 million of investment in machinery (i.e. fermentation silos, fruit processing line, sterilisers, fridges, and vacuum evaporation plant with an aroma collector and pressing machines) were imported from European companies such as Tetrapak and were acquired thanks to the fiscal incentives enacted the GoU. Such state incentives have allowed the company to invest in massive storage capacity that allows it to deliver products to the market all year round and maintain a stable supply on the supermarkets’ shelves. As a result, productivity and number of employees increased, the latter from 233 in 2010 to 519 in 2013 and reaching over 600 employees in 2015. The average wage for unskilled jobs is 30,000 sums per day (around US\$6) for a 12-hour shift with a meal provided (24 h/7 cycle), which is above the average wage for farmers.

Furthermore, thanks to the GoU’s effort to strengthen the food safety and SPS framework, which included the establishment of local certification agencies and regulatory frameworks to comply with WTO requirements (van der Meer *et al*, 2007), the company passed international tests for quality control certification in

sanitary, hygienic and inventory capacity, which improves GVC/GPNs integration. The GoU made available new service agencies that deal with marketing and quality control which, by providing new laboratory tests and certification necessary for the trading of fresh and processed agricultural products abroad, expanded the commercial networks capacity of these products while maintaining an arm's-length market.

As a result, the quantity of FFVs processed by Agromir rose from 21 million tonnes to 31 million tonnes between 2010 and 2013, producing 6 million jars of pickles/conserves and 42 million fruit juice bricks per year, with revenue reaching 88 billion Uzbekistani sums (US\$21 million) in 2013 and net profits increasing 10 fold in three years. Exports increased from US\$2 million to 7 million between 2010 and 2013. Thus, state-led governance in agribusiness can act as a trailblazer that is able to incentivise the introduction of new technologies, coordinate different economic needs along the chain, and build a reliable demand for local farmers, making the whole sector less mobile (i.e. 'footloose industry' Flamm, 1984).

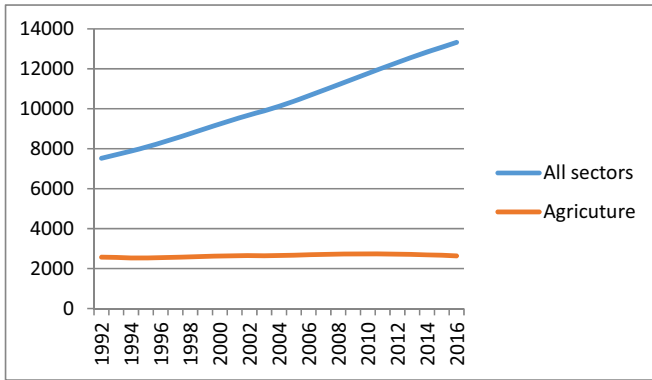
### **3.2. State-led upgrading: multidimensional implications**

The two case-studies described above show that the creation of state-led consortiums and a publicly coordinated and regulated contract procurement system along the value-chain has facilitated horizontal (i.e. backward-upstream) and vertical (i.e. forward-downstream) linkages across and within the FFVs value chain. Indeed, in many developing countries, short-term capital constraints have been an obstacle to the successful integration of local production into the GVC/GPNs. However, the state can be instrumental in filling such gaps. During interviews, policy makers acknowledged that because private capital was scarce, inputs and technology such as machinery, new seedling fertilizers and drip irrigation were only accessible with the support of (large-scale) public investment. Indeed, in the FFVs value chain, state-owned and joint-venture companies acted as risk-bearing businesses. They can operate without the pressure of short-term returns and high interest rates that are unfavourable for initiating capacity building of domestic technologies and know-how, thus triggering process of development.

Linkages to GPNs began to form as a result of the introduction of directional subsidies and investment in processing technologies, institutional coordination, multiple learning capacity, and upgrading mechanisms. This created an expansion of market segmentation and product diversification along different domestic sectors and value chains.

Multidirectional state interventions triggered more sophisticated processes of input transformation and faster forms of supply which deepened the social division of labour through new functions and competencies. Thus, direct and indirect employment across producers, traders, processors and suppliers were created (Bair, 2005; Gereffi, 2014). Interviews with farmers confirmed that rural workers prefer to be employed in the agro-processing companies rather than working seasonally on the farms, as wage employment is the most effective way to reduce poverty.

The development of the agro-processing industry also triggered functional upgrading that fuelled the demand for new professional profiles and specialised labour. This has been possible because the GoU has invested in local higher education so that chemists, agronomists and engineers could offer their skills to build an internationally competitive industry. The state-led efforts to expand and transform



**Figure 4.** Employment in Agriculture and other sectors 1992–2016.  
Source: WB, 2013

productive capabilities across and within sectors helps explain the patterns seen in [Figure 4](#). It shows how agriculture is less relevant as a source of national employment, while the absorptive capacities of other sectors have increased.

In addition to agro-chemicals, the GOU is investing in horizontal sectors. For example, the country is becoming a major regional producer of farm machinery, including combine harvesters, tractors, trailers, ploughs, hay balers, sprayers, rotary mowers and cultivators (FAO, 2014). This demonstrates the role of the public sector in coordinating coherent industrial ecosystems.

The upgrading of the food-processing sector by the state increased national fiscal revenues by adding value to raw commodities (Cramer & Sender, 2015; Gereffi, 2015), which is a necessary condition for boosting aggregate demand and consumption so that it can absorb the sector's supply in the delicate stage of development.

Hence, empirical evidence suggests that state-led horizontal and vertical linkages have been instrumental in widening the scope and scale of upgrading by facilitating the introduction of know-how and technology, enabling inter-sectorial spillovers, and reducing the short-term burden of financial barriers to investment. State intervention entailed product, process, functional, and inter-sectorial upgrading of the FFV industry while addressing societal goals.

From the evidence it is also clear that the huge gap between capital and labour costs in low-income countries hinders the dynamics of upgrading. If the labour price defined by the 'market' is too low relative to the price of capital, upgrading will not occur automatically because lead firms can still make a profit. In this scenario, both human and physical resources will remain underemployed. Indeed, an abundance of rural labour and tight wage-labour dependency can imply an extremely high rate of return from labour exploitation, dis-incentivising any productivity improvement and therefore perpetuating conditions of captive governance and slow economic transformation (Bernstein, 2010). Furthermore, local suppliers and nodes of production will get stuck in low-quality production with limited virtuous linkages to GPN (Selwyn, 2013). Such constraints suggest that introducing technology and innovation is necessary but not enough: complementary state-led capacity-enhancing strategies have to be present if upgrading is to be made effective and sustainable in the long-term.

In the next section I will discuss which, how and why state macroeconomic policies have co-enabled the vertical and horizontal spillovers during the upgrading of the FFV value chain.

#### 4. The macro interventions behind the Uzbek agro-industrial upgrading

Uzbek FFVs' upgrading and integration into the GVC/GPNs did not pass through the typical 'shock-therapy' of neoliberal prescriptions – i.e. rapid market deregulation, price liberalisation and privatisation - (Chang & Nolan, 1995; Spechler, 2008). That is why it is crucial to investigate how and why strategic macroeconomic policies on innovation, public finance, trade, and industrial policy have enabled these upgrading dynamics.

##### 4.1. Innovation policy and R&D

Although there is no automatic linear relationship between R&D and growth (Mazzucato & Perez, 2015:45), the GoU subsidised research to achieve product upgrading in FFVs that was tailored for strategic sectorial objectives. That occurred through a combination of coordinated macroeconomic policies on innovation. Given its budget and capacity constraints, the GoU has integrated investment in R&D and 'leapfrog' solutions to expand the quantity and quality of local FFVs value chains, thereby acting as *facilitator*, *buyer* and *producer* of innovation. First, the Ministry of Agriculture and Water Resources has financed agro-related R&D in Uzbekistan by establishing two national Research Institutes: one for vegetables, melons and potatoes and another for the plant industry, with 161 branches across the country (Musaevich, 2013). These research centres fostered innovation linkages

**Table 2.** Dynamics of funds spent for Agricultural R&D – selected years.

Indicators	2001	2005	2011	% relatively to 2001–2011
Budget funds, mln Uzbek soums	674.7	1055.0	10116.3	1127.3
Compared to total %	50.3	24.5		
Funds out of budget, mln Uzbek soums	450.0	4067.5	2944.7	545.5
Compared to total %	33.6	73.4		
FDI and grants, mln Uzbek soums	214.4	109.3	204.6	90.3
Compared to total %	16.0	2.0		
Total	1339.1	5537.2	13265.6	765.8

Source: Uzbek Agricultural Research and Production Centre. Musaevich (2013).

with local consortiums that led to the production of more profitable FFVs. Although available data on the amount of public investment in agriculture R&D are outdated, Table 2 shows a small but steady increase in funds allocated to research in agriculture. Moreover, in 2013 the commitment to R&D increased, with expenditures rising from 0.3 to 0.41 per cent of GDP (UNESCO, 2016).

Interviews with FAO, UNDP, and farmers suggest that although resources are still insufficient for meeting the sectoral objectives set by the GoU, the breeding of new seeds and FFVs varieties has nevertheless increased yields and expanded productive capacity. Second, as shown by the case of Okhalik consortium, the GoU has facilitated the import of new seedlings to compensate for the lag in local

innovation outputs. As a result of such crop-diversification, over 160,000 FFV agro-firms have been established in the country that supply both domestic and foreign players with higher returns on sale (Center for Economic Research – UNDP, 2017b).

Combined types of innovation have been possible because of the GoU's political commitment to prioritising long-term investment in the value chain rather than focussing on short-term gains (Mazzucato, 2013). This is a unique feature of state governance that cannot be replaced by profit-driven private businesses (Wade, 2018). As noted in the previous section, evidence suggests that in a context characterised by low skills and low private capital accumulation, technological upgrading is not automatically created but can be developed through a combination of state-led innovation and capacity-enhancing policies that go in the same direction (Dosi et al., 1988; Rodrik, 2004). If promoted by the state and operationalised through public institutions, R&D, emulation, and transfers (Lall, 1992) can enable these objectives.

#### **4.2. Public finance and foreign direct investments**

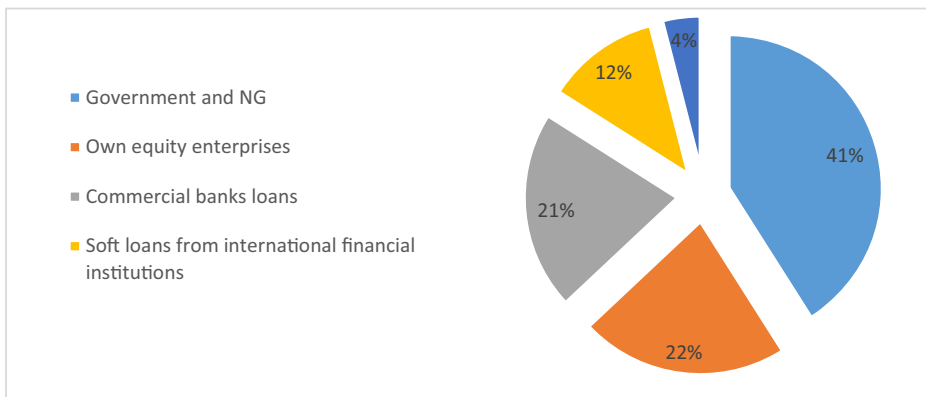
Another key aspect in understanding the role of the Uzbek state in FFVs' upgrading and GPN/GVC governance is unpacking its *regulatory* role on foreign capital and public finance. Through these two combined forms of investment, the GoU captured value from the GVC and shaped capital accumulation by retaining solid ownership of prominent firms in FFVs. The GoU has invested in the food-processing sector through various creative arrangements, including private-public partnerships, joint-ventures, and contractual consortiums that are facilitated by tax incentives, restrictions, and financial agreements.

As evidence from other countries suggests, the relation between upgrading and FDIs is controversial. FDIs can be detrimental to low income countries' ability to upgrade. The nature of joint-venture contracts can be rigid and biased against the country's interests, particularly when the public objective is to tackle inequality and reach inclusive growth (Bayliss & Van Waeyenberge, 2018). To avoid predatory investment, the GoU has shaped the flow and type of FDIs through 'local-content' conditionalities: companies must have funds of at least US\$150,000 and must earn over 60 per cent of their income through the sale of the goods or services they produce or provide. Also, the share of foreign investments must not be less than 30 per cent of the company's capital. Furthermore, ad-hoc frameworks are in place to attract FDIs that can specifically trigger FFVs upgrading. FDIs in agribusiness benefit from targeted tax incentives such as the waiving of customs duties on the import of special ingredients, technological equipment, components and spare parts that are not produced domestically but are used in the processing of vegetables and grapes<sup>3</sup>. To encourage the timely replacement of obsolete equipment, a charge of 0.25 percent of the equipment's historical value is collected from legal entities (except for micro and small enterprises) for the continued use of such equipment, but revenue from the sale and disposal of fully depreciated equipment is exempted from tax. Foreign companies producing agricultural products are exempted from asset tax (PwC, 2016) and enjoy protection against expropriation (USDA, 2014; Decree № 105 7 April 2011). Furthermore, the tax burden on companies has been eased. The current corporate tax rate is nine per cent, and a performance-based reduction is available if export sales exceed 15 percent and at least 50 percent of

the income generated is reinvested in the development of the company (Deloitte, 2015). As a result, new Greenfield investment appeared in the economy. This injection of foreign capital has prompted the development of processing sites where technology and innovation were formerly scarce, thus enhancing the local technological base. Although interviewees noted that both public and private investment are low and increasing slowly, Uzbekistan is now ranked as the fourth highest transition economy by number of joint-ventures and the world's Top 20 business climate improvers as a result of these investments (WIR, 2016; WB, 2019)<sup>4</sup>. Indeed, since the country's independence, the FFVs value chain has attracted more than 200 joint ventures involving investors from Europe, Turkey, Russia, Switzerland, the USA, and South Korea. FDIs in the agro-processing sector are growing, with total investments in the agri-sector amounting to US\$2.3 billion in 2015 (WIR, 2016). The state-led mix of restrictions and incentives *facilitated* the development of vertical and horizontal spillovers to domestic industries and protected national champions in a coordinated the industrial strategy (Horner, 2017).

Interviews with policy makers also suggested that foreign businesses encountered transaction costs in repatriating earnings because of the state's complicated bureaucracy. Such a business environment discouraged foreign private investment. However, in 2017, as part of the market-oriented reforms, the currency market was liberalised, allowing citizens and companies to buy foreign currency at a market-set rate (UzDaily, 2017) which, according to interviewees, simplified the mobility of international capital.

In addition, farmers in 2015 frequently identified a lack of cheap credit for investment in technology or skilled labour as a limitation to upgrading. However, private FDIs and International Financial Institutions like the IFC-WB group have become increasingly involved in financing the Uzbek agro-food industry. Through the Global Trade finance program, the portfolio of local commercial banks has been expanded to be able to issue agro-loans to agro-firms. Moreover, in 2014 the IFC invested US\$120 million to support 31 projects in the agro-food chain and acted as an advisor. Although the loans contributed to increased investment in the private sector, by 2013 the GoU was still the major source of funding for domestic



**Figure 5.** Sources of investments in agriculture.  
Source: UZstat (2013)

investments (available data- [Figure 5](#)) because it borrows at a much lower interest rate, thus avoiding the pressures of profit's short-terminism (Naqvi, 2018).

Therefore, in this case study we do not observe a 'foreign capital-driven sector' or a 'captive' value-chain in which foreign firms use their financial power to subordinate local suppliers by creating technological, financial, and job dependency. Rather, the state attracts foreign capital while regulating the financial system, which enables transformational processes of capital accumulation that are necessary to escape the middle-income trap (Wade, 2018). Agro-processing firms have been able to invest and upgrade with state support and by engaging with international capital—a proposition that contradicts the literature, which sees FFVs global lead-retailers as the only window for upgrading (Humphrey & Schmitz, 2004). The GoU has intervened as a *facilitator* to attract FDIs, but through *regulatory* conditionality it retains a 'golden stake' in crucial nodes of the sector. Thus, it acts as a *producer*, allowing it to select and mediate market price competition. Venture capital operates under the government's cover and warranty for the most uncertain and costly investments (Mazzucato & Perez, 2015).

This case-study suggests that, in a situation of financial constraint, governments have a crucial role in balancing risks and long-term returns and people's needs. Virtuous forms of partnership, if effectively regulated and incentivised by the state, trigger technological transfer and employment creation. The state configured a legislative and regulatory financial framework able to attract and retain FDIs while promoting industrial development (Ahrens, 2008; Khan, 2007; Horner, 2017). At the same time, it also guaranteed that local actors maintain the power to influence the GVC/GPNs for their own developmental objectives.

### 4.3. Trade policy

The Uzbek agro-industrial upgrading was supported by a state-led expansion of FFVs domestic production, which was facilitated by various state policies. First, the GoU used its role as *regulator* to implement targeted protectionist policies, includ-

**Table 3.** Excise taxes on food imports.

Fresh fruits	100.0
Juice	70.0 (not less than 1 USD per litre).
Fresh meat	30.0
Frozen meat	70.0
Cheese	70.0
Sausage	50.0
Sugar	10.0
Wheat	10.0
Oil	20.0

Source: Ganiev & Yusupov (2012).

ing subsidies and indirect taxation to modulate the quality and quantity of the import of intermediate and final commodities. [Table 3](#) shows that the import of different food types was taxed at different rates depending on whether they directly compete with the strategic objective of boosting local production. While fresh FFVs and dairy products are severely taxed, intermediate products that are domestically



scarce but necessary for the agro-processing sector (such as sugar and oil) are subject to a lower level of taxation.

As confirmed by unstructured interviews with ministries, managers, and FAO, the state actively and selectively protected agri-commodity imports to support and favour the upgrading of local agro-processing value-chain. Indeed, protecting domestic infant industries can trigger positive effects for commercial agriculture (Friedma & McMichael, 1989). Furthermore, a new source of fiscal revenue for the state was created when the quality of FFVs reached a level that was attractive for regional and international markets, thus supporting long-term local investments and integration and expansion of local business within GVC/GPN (Mazzucato & Perez, 2015).

Furthermore, by arranging bilateral trade agreements and trading blocks, the GoU facilitated and regulated the upgrading of the FFVs value chain. The geography of the Uzbek trading network suggests that the GoU has used historical, linguistic and political closeness to set up the current strategic commercial linkages to spur exports. Public governance has therefore prioritised geographical and relational proximity in GVC/GPNs (rather than multilateral, western style governance) to minimise multiple transaction costs. The GoU used political and cultural-linguistic affiliations to build regional and bilateral commercial networks with former Soviet countries (Gereffi, 2014). For instance, trading with Kazakhstan—a member of the Eurasian Economic Union (EEU)—allows Uzbekistan to trade freely with the entire EEU bloc. Moreover, the GoU also used the geo-political friction between the EU and Russia and consequent embargo that began in August 2014 (EPB, 2015) to strengthen its commercial relationship with Russia. In April 2017, Russian and Uzbek representatives signed a bilateral trade agreement for FFVs and processed food worth US\$612 million.

In its role of *facilitator* of FFVs' commercialization, the GoU also developed a national and international strategy of rebranding aimed at expanding the export potential of the FFVs value chain through a series of marketing operations. The GoU financed stalls at the Expo Milan 2015, established trading houses and representative offices in Russia and Kazakhstan, and planned to open commercial hubs in Europe, India, the UAE, and East Asia. Through a presidential resolution on 'measures to organise and hold an international fruit and vegetable fair', in 2016 the GoU organised an international fair involving the ministries of foreign economic relations, investments and trade, agriculture and water management, 'Uzbekoziqovqatholding'—a foodstuff holding company—and 'Uzbekoziqovqatzahira', an association for storing and harvesting fruit.

Hence, in its roles as *regulator*, *facilitator* and *seller*, the GoU has organised a trade policy built on a combination of selective protectionism, export orientation based on regionalism, bilateralism, and timely marketing operations. This policy contributed to the strengthening of domestic agro-industrial upgrading and engagement with GPNs while bypassing multilateral trade nodes.

#### **4.4. Industrial policy**

Because FFVs are 'time-sensitive' commodities subject to seasonality, perishability and are scattered in remote rural areas, their commercialisation is difficult. Hence, FFVs need to be efficiently stored in cold-chain infrastructures (i.e. backward

linkages) and then commercialised for various market destinations in a timely manner (i.e. forward linkages). Despite being fundamental for commercial access, infrastructure and storage facilities were considered insufficient by interviewees, which have contributed to the fluctuation of FFVs' prices and supply. Post-harvest losses due to logistical barriers and high transport costs have been identified in the tomato and apple supply chains in many districts (Center for Economic Research – UNDP, 2017b; Hasanov, 2016; USDA, 2014). Furthermore, procedures for sanitary and hygiene standards were neither standardised nor sufficiently widespread, especially in the most remote areas, creating barriers to exporting FFVs.

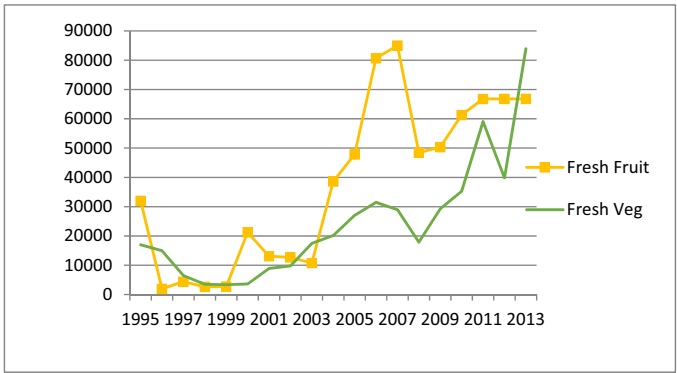
In response to such infrastructural gaps, the president founded Uzagroexport in 2016, a governmental agency that, like in other latecomer countries, acts as an export marketing board and industrial planner (Lee, 2013; Mazzucato & Perez, 2015). Uzagroexport has been instrumental in a) investing in ad-hoc infrastructures such as refrigerators, warehouses in harvest areas, storage facilities and sorting and grading machinery, b) coordinating the supply of packaging materials with firms, logistics and transportation, and c) in providing a quality management and standardisation centre. Uzagroexport has therefore acted as a *co-producer* of the FFVs value chain that understands and addresses entrepreneurial risks and opportunities.

At the start of 2016, Uzagroexport implemented an ad hoc monopsony system of procurement and a monopolistic export system. The result of this scheme was producers receiving 25 per cent of the revenue gained from their exports in local currency because the GoU converted this proportion in order to retain hard currency. Interviewees noted that this 'commission fee', together with a lack of insurance, was a significant loss for farmers because of the non-convertibility of the Uzbekistani som. However, current president Mirziyoyev suspended this measure in September 2017. Although it increased production costs for FFVs farmers, it stabilised both food supply and food prices in a timely manner (Center for Economic Research – UNDP, 2017b), contributing not only to the stability of the value chain but avoiding food shortages and price volatility for consumers, thus addressing both social and economic objectives.

State governance has played a significant role in expanding access to GVC/GPNs through investment, commercial partnerships, regulations, and non-market incentives. By expanding infrastructure and marketing operations (UNIDO, 2009), the GoU helped to transform the local agri-industrial productive capabilities. These policies co-boosted local revenue through integration into GVC while fostering product and processes diversification. This case study highlights that the state can not only strengthen horizontal and vertical linkages through public and private institutions, but can also link private actors' businesses to its own developmental objectives. It also confirms that policy makers and academics should go beyond the issue of whether or not the state should intervene in GVC governance and focus instead on how it should do so to address its multiple mandates (Cramer, 1999; Humphrey & Schmitz, 2004; Khan, 2008).

## 5. Organisational upgrading

In this section, using a strategic-relational approach and the concept of organisational upgrading, I will discuss the links between state-led upgrading and development outcomes.

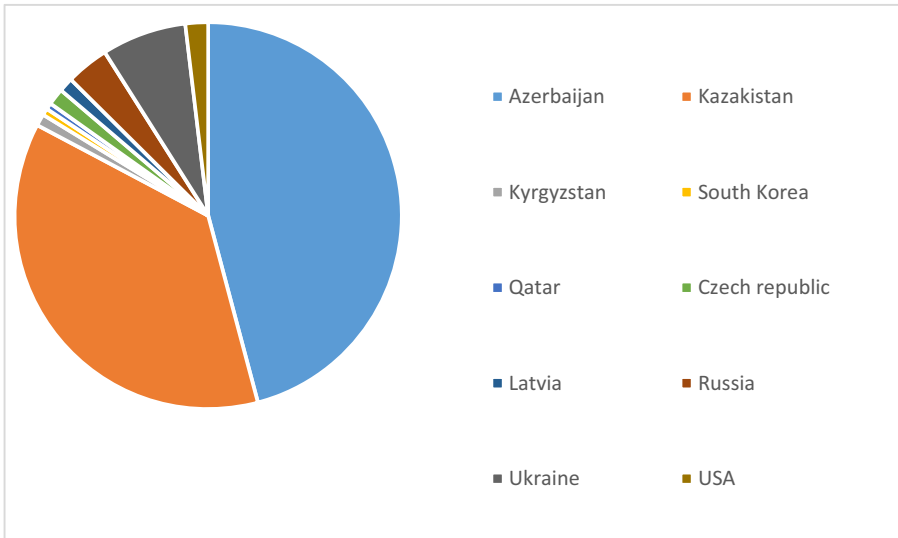


**Figure 6.** Export quantity (MT) of fresh fruits and vegetables (1995–2013).  
Source: FAOSTAT

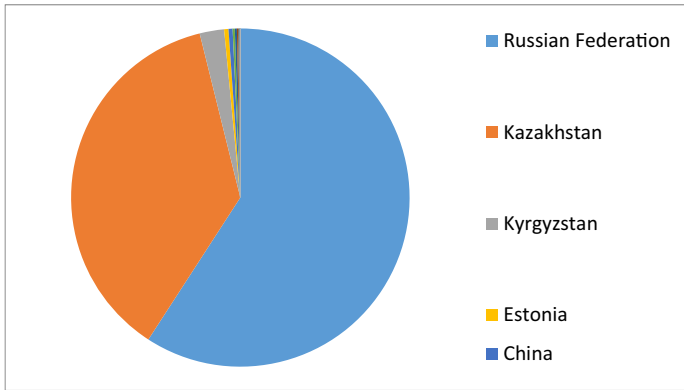
**5.1. The recent outcomes of uzbek state-led agro-industrial upgrading**

The data show that through multi-directional and multi-scalar interventions, Uzbekistan has become one of the main producers of FFVs in the Commonwealth of Independent States (CIS) region. In 2016 Uzbekistan produced more than 9 million tonnes of FFVs, and around 800 thousand tonnes, or around 7 per cent of total output, were exported. The volume of FFVs exports expanded exponentially over recent years, replacing traditional export commodities (WB, 2015) (Figure 6). In 2015 the value of FFVs exports amounted to US\$492 million and reached US\$708.8 million in 2017. The GoU’s objective is to export 2 million tonnes of FFVs annually by 2020 (FAO, 2014; Uzagroexport report, 2017).

Also, the export destinations expanded, including to Azerbaijan (46 per cent), Kazakhstan (37 per cent), Ukraine (7 per cent), Russia (4 per cent) and the USA (2 per cent) (Figure 7).



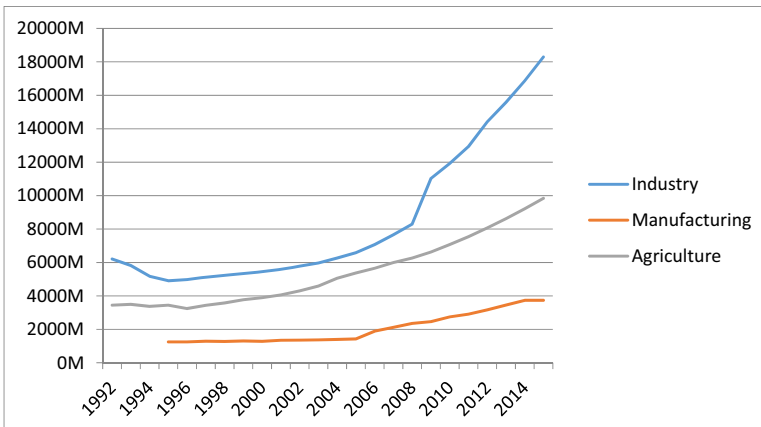
**Figure 7.** Export destinations for fresh fruits and vegetables.  
Source: OEC (2015)



**Figure 8.** Destination countries of processed Fruits and Vegetables.  
Source: Trade Map (2017)

Exports of processed FVs are smaller in volume than those of unprocessed FFVs, which form 75 per cent of Uzbekistan's agro exports. Exports of processed food and nuts from Uzbekistan amount to US\$254 million (CER, 2017a) and are growing steadily as a result of continuous public investment. The main destinations are regional markets, with 46 per cent going to Azerbaijan and much of the rest going to Kazakhstan and other Central Asian countries, although Eastern Europe and China are becoming increasingly important destinations (Figure 8).

Such results have been possible due to a multi-scalar state-led strategy, which enabled upgrading of the Uzbek horticulture value chain and beyond. The GoU has acted as a coordinator of vertical and horizontal spillovers along the FFVs value chain, across and within sectors and towards the GPNs while maintaining a productive system based on an arm's length market. The value of production in the overall agricultural sector – Figure 9 – has increased as result of the expansion of livestock and FFVs production, as well as of employment and of income.



**Figure 9.** Value added by sector (constant 2010 US\$).  
Source: The World Bank

The underlying state-led institutional reconfiguration through which inter-sectorial and spatiotemporal developmental objectives were coordinated, and through which resources and information were transmitted, is here described as ‘organisational upgrading’. Organisational upgrading not only affected the GVC/GPNs but enabled ongoing development.

## **5.2. Organizational upgrading and the political economy of development**

The GoU affected organizational upgrading by intervening within and outside of the GVC/GPNs while coordinating developmental objectives. To untangle organizational upgrading, we must first expand on the ‘developmental’ implications of a state that is *buying* and *producing*. A criticism that the literature raises about the Uzbek economy and other developing countries is that the GOU, by maintaining control of the FFVs’ production and distribution through a parastatal agency, distorts market signals, creates rent-seeking, and efficiency-losses while hampering market competition and local investment (Ergashev, 2015; Petrick & Djanibekov, 2016). Like in other developing economies, deregulation, privatisation and market liberalisation have been depicted by the WB and IMF as the best policy solutions for triggering upgrading dynamics in Uzbek agriculture (WB, 2015; IMF, 2008). However, as the DS literature points out, even if rent is produced through public institutions such as Uzagroexport, it is retained and re-circulated within the national economy (Chang, 2009; Khan, 2007). Indeed, in cases of market liberalisation, profits have often been co-opted by foreign traders and MNCs, meaning that revenue is expatriated without creating any multiplier or spillover effects in the local economy. Indeed, empirical evidence from other developing countries shows that in the early 1990s, cash-crop exporting countries that dismantled their marketing boards and liberalised their markets saw that the value derived from the reduction of post-farm costs was not appropriated by farmers, but by consuming countries (Kaplinsky, 2004:12). As a result, sub-contractual terms worsened and small producers were unable to escape the low rank positions assigned to them by the buyer driven GVC governance. This produced low input intensity and inefficiency and subsequently halted the dynamics of upgrading and inter-sectorial growth. As this case study shows, the creation of local linkages and spillovers not only provides economic incentives such as profit maximisation, but also supports political and social goals such as creating employment in rural areas, boosting wages, and guaranteeing a stable income for farmers—explicit political objectives of the GoU. Yet, it must be recognised that the process of productive transformation is not a win-win arrangement, and has entailed undesired distributional implications. Smallholders in particular are currently squeezed by this two-front transition. On the one hand, as mentioned above, they are still exposed to conditions of unemployment and/or underemployment because the capacity of labour absorption of the processing sector and manufacturing at large is still low, which has negative consequences for poverty. On the other hand, farmers who are not producing at a certain scale or volume are excluded from the more profitable circuits linked to international markets, and therefore do not enjoy improvements to their economic conditions. Nonetheless, if small producers are exposed to unregulated markets, the related risks will be individualised by the farmers themselves. This scenario is not a driver for long-term sustainable and inclusive growth, and predatory governance will

outpace the value created by the GVC/GPNs outside the country. Instead, a coordinated state-led strategy based on continuous multi-scalar support, time-sensitive incentives and institutional reforms (including in public procurement and provision) can enable economic upgrading, along with incremental social and economic change at scale.

A second point to highlight concerns the desirable multiplier effects that the state triggered by acting as a strategic *regulator*, *facilitator* and *seller* in the market. In a global trade environment dominated by WTO rules, it is often believed that trade liberalisation stimulates the integration of domestic suppliers in the labour-intensive GVC/GPNs, thus enabling the transfer of technology and know-how (Cramer, 1999). In countries with abundant supply of unskilled workers and land per capita, World Bank agri-chain policies focus on strengthening the links between local small-holder farmers and the lead-firms of the GVC/GPNs (Webber & Labaste, 2010). Free market and supply-side policies based solely on quality and productivity enhancement are believed to be conducive to development and upgrading (Krueger, 1997; Lin & Chang, 2009). However, these propositions have been widely criticized in the DS literature and are disproved in this case study. Firstly, they overlook or overrate the economic and financial capacity of local private governance, which limits the upgrading of agro-industry and the creation of local demand in the market. Secondly, they overestimate the developmental potential of joining the GPNs through small-scale farming. Productivity enhancement remains the main driver of capitalistic growth but small-scale suppliers are often disadvantaged, especially in commodity production for which there are high initial costs and slowly increasing marginal returns that create barriers to entry (Lee 2013; Mazzucato & Perez, 2015). In fact, structural obstacles linked to the creation of economies of scale, technological upgrading, viable commercial channels, and capacity building have been overlooked, as have the structural power asymmetries between local farmers and MNCs (Bernstein, 2010; Selwyn, 2013). Hence, it seems unlikely that upgrading is driven by market liberalisation, deregulation, and small-scale businesses (Horner, 2017). As this case study suggests, successful socio-economic transformations were historically based on uneven and discriminatory state-policies, often relying on subsidies, credit, and price stabilisation schemes in agriculture (Bernstein & Oya, 2014; Chang, 2009) Indeed, protective tariffs were widely used by western economies in the twentieth century to facilitate the commercialisation of domestic agriculture (Friedma & McMichael, 1989). Thus, although protectionism and import substitution policies have been criticized for creating corruption and bureaucratic rent-seeking and for hampering the expansion of the private sector (Krueger, 1997), the evidence suggests that selected protectionist trade and industrial policies can be essential for enabling developmental upgrading (Rodrik, 2004). Short-term distortions can create long-term increases in productivity that allows spillovers between domestic suppliers and global capital markets. The state can enact regulations to shape the domestic comparative advantage and add value to traded commodities. In this case, the GoU facilitated new commercial partnerships while creating inter-sectorial upgrading. It has also negotiated economic agreements by establishing ties between nation states, and supported the establishment of large and stable commercial contracts for FFVs farmers, providing them with a stable income. It has exploited economies of scale to acquire machinery, source reliable and affordable inputs, train and employ rural labour,

and access credit and information. These multidimensional achievements enhanced the position of the Uzbek industry in the GVCs but also developed societal benefits.

All the state's functions were strategically coordinated and linked with inter-temporal societal and political objectives that lie outside the GVC (Chang, 2009; Jessop, 2008). In particular, the GoU, by supporting national food production, by mediating the flow of food exports and subsidising inputs, and by using protectionist policies, avoided fluctuations in food supply in the domestic market and deflected the risk of food shortages, thereby serving its objective of food security (Lombardozi, 2018). Indeed, Uzbekistan is one of the few countries that halved hunger by 2015, a target of the Millennium Development Goals. Another example of how the GoU linked upgrading to societal and ecological objectives is the state-led conversion of land from cotton to FFVs. Indeed, FFVs are not as water-intensive as cotton and are more labour-intensive; in this way, they were crucial in boosting employment in rural areas and preserving natural resources. Only the state has the capacity to identify and address these societal needs by planning timely and inter-scalar strategies of such scale and scope. In other words, the state sits in a unique position to mobilize and transfer resources and assets which could have not been deployed by private governance.

Evidence suggests that organisational upgrading is needed to arrange complex shifts in production capabilities that require large investments in the acquisition of technology, innovation, and know-how. The government identified strategic and potentially interlinked value chains, invested in them, and planned and created incentives which purposively provided initial rent to incentivise productive and learning opportunities for infant firms (Horner, 2017; Lee, 2013). It has shaped and coordinated market and non-market institutions in the early stages of development, thereby enabling social and economic transformation (Bair, 2005). Through state ownership and public procurement, the GoU was able to stimulate domestic production and its integration into GVC/GPNs while allowing technology to be accessed and diffused. This state-led institutional reconfiguration has shaped the nodes and power of commodity chains (Dicken, 1994; Ponte & Sturgeon, 2014; Talbot, 2002). At the same time, it served distributional outcomes for firms and workers (UNCTAD, 2016), created jobs, and increased incomes and fiscal revenues. Through organizational upgrading, the state responded to various needs and pursued multiple strategic developmental objectives.

## 6. Conclusions

This article used the Uzbek FFVs value chain to shed light on how state-led coordination strategies across, institutions, time, and scales shaped inter-sectorial economic upgrading at the micro level and triggered the present developmental changes. This case suggests that organisational upgrading was essential for the redefinition of the production structure and employment regimes in the long-run (Fine & Dimakou, 2016; Gereffi, 2014). Upgrading also helped overcome the boundaries of the agriculture-industry-service complex, driving pro-poor growth through strategic horizontal and vertical linkages in the domestic economy, and within GVC/GPNs through inter-sectorial upgrading.

The article has also bridged the micro-meso level analyses of upgrading with macro-level discussions about the role of the state in GVCs. In particular, it looked at the state's multiple functions of *buyer*, *regulator*, *facilitator* and *producer*, and has shown that the GoU has managed to attract FDIs and avoid instances of captive governance and predatory sub-contracting. Macroeconomic policies provided the institutional space to build local capabilities at the micro-level. Trade policies and selected protectionism have been crucial for technology transfer and for the creation of new market channels. The current challenge is to phase out tariffs while capturing value and market share in the GVC/GPNs.

In conclusion, this case study has shown that in contradiction with neoliberal prescriptions, gradual state-led institutional and regulatory reforms have been able to minimise the negative impacts on the weakest nodes of the local value chain during the process of GVC/GPNs' integration by securing stable food prices, inputs, and income, (Chang & Nolan, 1995). By the same token, despite rent-seeking and a rather authoritative public governance, gradual and targeted liberalisation has allowed the implementation of stable, large-scale economic investments that triggered upgrading in local value-chains (Stark & Ahrens, 2012) and acquisition of foreign exchange used to finance the upgrading processes. Therefore, it is argued that a solid state-led coordination of market and non-market institutions and agents—known as organisational upgrading—is fundamental for the creation of coherent and inclusive developmental linkages with GPNs, and therefore must be systematically incorporated into GVC analysis and policy design.

## Notes

1. Horizontal spillovers occur between firms in similar or related production. Vertical spillovers occur between firms in contractor-supplier relationships. Backward linkages take place when there is flow of information and resources between a firm and its suppliers. Forward linkages take place when investment in higher-value production is enabled.
2. For orchards, 'returns to investment in the first year of harvest are low, as the trees produce only 4 tonnes of fruit, but it increases to 8 tonnes in the second year, 15 tonnes in the third, 20-25 tonnes in the fourth (to arrive to a maximum of 40 tonnes).
3. Presidential decrees № YII-3860, dated 14.03.2007 and № UP-4354, dated 24.08.2011.
4. According to the World Investment Report (WIR, 2012), Uzbekistan was ranked 78th/181 by the FDI Inward Attraction Index in 2011, significantly improving its 2000 position of 143.

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