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Structural change ramifications of consumer credit expansion in a two sector growth model

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2021

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Structural Change Ramifications of Consumer Credit Expansion in a Two Sector Growth Model*

Esra Nur Uğurlu

Abstract

This paper analyzes the structural change implications of consumer credit expansions in a dual-sector open economy growth model. Policy-induced increases in banks' willingness and ability to lend result in new consumer lending, boosting consumption demand and average wages in the nontradable sector. Under the assumptions of fixed relative wages and mark-up pricing, wage pressures translate into inflationary pressures. The central bank, acting under the sole target of controlling inflation, raises the interest rate to contain inflationary pressures. This intervention causes a real exchange rate appreciation, followed by a loss of international competitiveness in the tradable sector. This way, the model illustrates that consumer credit expansions can trigger *premature deindustrialization*, shifting sectoral structure in favor of the nontradable sector. The formal model is inspired by the Turkish economy that experienced a notable expansion of consumer credit between 2002-2013.

Key Words: Consumer credit, structural change, economic growth, inflation targeting, real exchange rate

JEL Codes: E58, F43, L16, O11, O41

1 Introduction

Over the past 70 years, consumer credit has grown substantially both in developed and developing countries – especially in the latter (Müller, 2017). However, the implications of rising consumer borrowing for economic growth have been discussed mostly in relation to developed countries, particularly the US (Mian & Sufi, 2015). In contrast, the research on the macroeconomic effects of consumer credit expansions in developing countries has been somewhat limited. Did consumer credit expansions generate high growth rates in developing countries? If so, was this achieved through improving productive capacities or fueling unsustainable demand booms? How did consumer credit expansions articulate with the sectoral allocation of resources? There is a need to address these questions taking into consideration the structural features of developing countries, where the macroeconomic implications of consumer credit expansions differ by virtue of the distinct growth challenges faced in these economies.

*I am especially thankful for Peter Skott's helpful guidance on earlier drafts of this paper. I would also like to thank Adam Aboobaker, Arslan Razmi, Gerald Epstein, and participants at the Analytical Political Economy Workshop at UMass Amherst and London School of Economics Workshop on Development Planning for their helpful comments and suggestions. Any remaining errors are my own.

While the primary growth obstacle faced by mature economies concerns the insufficiency of aggregate demand, the growth challenge faced by dual economies is more akin to a structural transformation problem (Aboobaker & Ugurlu, 2020; Skott, 2021). Therefore, in mature economies, consumer credit expansions can prove to be effective in stimulating economic growth by fueling domestic demand, notwithstanding its adverse distributional and financial stability implications. In contrast, in dual economies, large expansions in consumer credit can have detrimental consequences if it causes macroeconomic imbalances, such as exchange rate overvaluation or trade imbalances, or deteriorates the sectoral structure by expanding the nontradable sector at the expense of the tradable sector. The gaps in our knowledge on these issues beget a need to examine the structural change implications of consumer credit expansions in dual economies.

This paper aims to fill this gap by analyzing the macroeconomic and sectoral effects of consumer credit expansions in a two-sector open economy growth model. The model features an inflation-targeting central bank and credit-constrained worker consumers. The expansions in consumer lending are explained by changes in banks' willingness and ability to lend. The model illustrates that consumer credit expansions of this type can generate *premature deindustrialization*, whereby low productivity sectors, often associated with the production of nontradable goods, dominate the sectoral structure before the economy goes through a sufficient experience of industrialization (Rodrik, 2016).

The growth of consumer lending in developing countries can best be interpreted in the context of the adherence to the so-called (post) Washington Consensus policies from the late 1970s onward. The Washington Consensus, propagated by key Bretton Woods institutions like the IMF and the World Bank, juxtaposed a set of economic policies and institutional transformations that already held sway in developed countries. These included fiscal discipline, inflation-targeting, flexible exchange rate system, privatization of state-owned enterprises, and rolling back of welfare state (Fine *et al.*, 2003).

The transformation of policy making under these imperatives has significantly limited the room of developing countries to carry out expansionary fiscal and monetary policies¹. While possibilities to expand domestic demand through these conventional means were being constrained by this new hegemonic agenda, new opportunities emerged to stimulate domestic demand through credit-financed consumption. Consumer indebtedness has been consistently encouraged through policy changes at the national and international levels (Dos Santos, 2013, p. 325). The expansion of consumer credit did not only provide an expedient solution to the inability to boost economic activity through expansionary policies, but it also provided governments means of mediating distributional tensions aggravated by the Washington Consensus model of economic management. By delinking domestic demand generation from wage growth, consumer borrowing provided a way of stimulating demand without challenging the distributive interests of the capitalist class. The working class, on the other hand, was at least partly compensated for any decline in their purchasing power stemming

¹Here and in several other parts of the paper, I comment on developing country governments' decreased ability to undertake expansionary fiscal and monetary policy in a descriptive manner. Even if these countries' ability to engage in expansionary aggregate demand policies was not constrained, the desirability of aggregate demand stimulus is questionable in dual economies from the perspective of long-term structural transformation. While expansionary policies may be needed for short-run stabilization, sustained aggregate demand stimulus is likely to be incompatible with industrialization targets. See Aboobaker and Ugurlu (2020) and Skott (2021) for further elaborations on this argument.

from the implementation of Washington Consensus policies through increased borrowing opportunities, while income was being redistributed from the working to the rentier class through interest payments on consumer debt (Hein, 2012). However, although credit-financed consumption was instrumental in fueling economic growth in the short-run while mediating class conflict, it was less successful with respect to structural transformation imperatives.

Turkey is a great exemplar of a developing country that experienced a substantial growth of consumer credit in recent decades with adverse effects on macroeconomic balances and the sectoral structure. The formal model developed in this paper is inspired by the developments in the Turkish economy during the period 2001-2018. However, the paper offers implications for a broader set of developing countries that have gone through similar experiences, particularly in Latin America and Eastern Europe (Gabor, 2010; Garber *et al.*, 2019; IMF, 2006).

Turkey entered the 21st century with a major economic crisis in 2001, followed by an IMF-supported disinflation program named “Transition to a Strong Economy” (TSE). In compliance with this program, the economic management committed to implementing a set of standard Washington Consensus policies, with an emphasis on fiscal discipline and restructuring of the banking sector. This program was fully adopted by the subsequent AKP² governments. Being bound by primary fiscal surplus targets and lack of an industrial strategy to stimulate exports or investment, the TSE program left limited scope for AKP governments to boost economic activity. In subsequent years, the rise in consumer credit functioned towards filling this vacuum. The strategic importance assigned to the construction sector by the AKP amplified the functional importance of consumer credit markets even further. In effect, the TSE program has sown the seeds of a consumer credit-driven growth model.

Besides assigning a functional role to consumer credit expansions regarding fueling domestic demand, the TSE program also enabled and encouraged the banking sector to increase consumer lending through the fiscal and banking reforms it introduced. Throughout the 1990s, commercial banks were investing heavily in high-yielding government debt instruments (with an average real interest rate on government securities of around 30 percent) and subsequently providing too little credit to the private sector at high interest rates and crowding out real investment (Bakir & Öniş, 2010). Therefore, the TSE program was formulated based on the understanding that reducing the government deficit, lowering interest rates on government debt instruments through a disinflationary program, and restricting the purchase of Treasury securities by commercial banks would crowd-in investment by encouraging commercial banks to lend to the corporate sector. However, in the context of cheap borrowing opportunities in the international markets, supported by the inflation-targeting framework that tolerated real exchange rate appreciations due to its role in controlling inflation (Benlialper & Cömert, 2016), large corporations decreased their reliance on the domestic banking sector. The end of an era of profiting off high interest rates on Treasury securities accompanied by lower demand for domestic bank credit from large corporations encouraged commercial banks to find new profit generation sources (Karaçimen, 2014). It was in this context that consumer credit provision became a vital business strategy for the Turkish banking sector. The end result of these developments was a remarkable

²AKP is the Turkish acronym for Justice and Development Party that has been in a single-party government since 2002.

increase in the consumer credit to GDP ratio (figure 3).

Although consumer credit growth supported high GDP growth rates through stimulating consumption expenditures, particularly between 2003-2007, a period referred to as the “Tulip Era”³, this period was much less successful judged by other key indicators, such as stagnating investment rates, an overvalued currency, sustained and deteriorating current account deficits, and shifts in the sectoral structure favoring low-productivity sectors. While several illuminating descriptive accounts highlighted the weaknesses of Turkey’s post-2001 growth experience (see Orhangazi and Yeldan (2021) as the most recent example), there have not been many attempts to illustrate the potential mechanisms through which consumer credit expansions played a role in generating these detrimental outcomes, particularly with respect to the sectoral structure.

The contributions of this paper are hence two-fold: 1) to develop a two-sector growth model that illustrate the complex macroeconomic mechanisms through which consumer credit expansions can impede structural change when borrowing constraints that consumers were hitherto subjected to are lifted, and an inflation-targeting regime is in place 2) and by way of this, to critically evaluate the short-termism of growth strategies various developing countries, like Turkey, adopted during the 2000s.

The mechanism by which consumer credit expansions undermine structural transformation can be summarized as follows. In the model, incomes in the nontradable sector are demand determined. Consumer credit expansion boosts consumption demand and, related to this, the average incomes (wages) in the nontradable sector. Under the assumptions of fixed relative wages across the two sectors and fixed mark-up pricing, wage pressures translate into inflationary pressures. The central bank, acting under the sole target of controlling inflation, raises the interest rate to contain domestic price increases. However, this intervention causes the real exchange rate to appreciate, followed by a loss of international competitiveness of the tradable sector. The resulting displacement of labor away from the tradable towards the nontradable sector negatively affect long-run growth prospects, given the differences in labor productivity between the two sectors.

It should be noted at the outset that the model developed in this paper shares some affinities with the three-sector model developed by Martins and Skott (2021), which addresses the inflationary effects of commodity price booms. In Martins and Skott’s paper, a boom in commodity prices creates wage pressures and inflationary tendencies, to which the inflation-targeting central bank responds by raising the interest rate, generating a real exchange rate appreciation. The subsequent fall in the tradable sector profitability generates deindustrialization. The model presented in this paper is similar to that of Martins and Skott insofar as both papers feature i) a temporary boom to domestic demand, ii) inflationary tendencies linked to relative wage structure, and iii) inflation-targeting central bank. However, the papers also differ in few critical ways. Most importantly, they analyze different sources of expansion to domestic demand. While a boom

³The ‘Tulip Era’ historically refers to the period between 1718-1730 during which the ruling classes in the Ottoman Empire enjoyed “extravagance, conspicuous consumption, and cultural borrowings from both East and West.” (cited in Kurt, 2020, p. 4). Turkey’s leading Marxist economist Korkut Boratav refers to the 2003-2007 period, during which the first AKP government was in power, as the “Tulip Era” (Boratav, 2018), given that the government’s macroeconomic management during this period has often been praised uncritically and out of proportion by liberal commentators and mainstream economists (e.g., Acemoglu and Ucer, 2015).

in commodity prices expands domestic demand in Martins and Skott, this paper focuses on policy-induced expansions in consumer credit. As a result, while consumer debt dynamics and the banking sector do not feature in Martins and Skott, they are of prime importance to this paper. Besides, different than Martins and Skott's model, the model presented in this paper explicitly considers financial stocks and flows.

The rest of this paper is organized as follows. The second section briefly discusses the related literature. The third section motivates the formal model through a descriptive analysis of key macroeconomic trends of Turkey between 2002-2018. The third section presents a two-sector open economy model to examine the structural change ramifications of consumer credit expansions. The final section concludes.

2 Related Literature

The post-Keynesian literature on household debt is of primary relevance to this paper⁴. However, I depart from it in three main directions. Firstly, in much of this literature, the expansion in household borrowing is attributed to a greater demand for consumer borrowing stemming from the deterioration in income distribution observed in industrialized economies since the early 1980s (e.g., Barba and Pivetti, 2009).⁵ On the contrary, in this paper I highlight the changes in banks' ability and willingness to lend as a key driver of household credit expansions. In this respect, the specification of debt dynamics has affinities with Dutt (2006) and Ryoo and Kim (2013).

If borrowers do not wish to go to the limits of credit available to them, the total amount of credit will be constrained by credit demand (Dutt, 2006). When this is the case, the institutional changes that alter the supply of credit will be ineffective in stimulating the amount of borrowing; thus, changes in credit conditions can be explained mainly by the demand-side factors (*ibid.*) On the contrary, if borrowers are already in debt up to their credit limits, the total amount of credit will depend primarily on the banks' willingness and ability to lend. In the case of Turkey, as will be discussed in the next section, policy induced transformations in government financing and banking sector in the early 2000s have led to diversification banking activities towards consumer lending. This transformation has greatly lifted borrowing constraints consumers were previously subjected to⁶. Similar policy changes that encouraged the growth of consumer credit was in place in other developing countries, such as *crédito de nómina* loans across Latin America, and requirements on commercial banks to meet certain targets in mortgage loans in a wide array of countries like Brazil and Malaysia (Dos Santos, 2013). Therefore, the formal model presented in this paper explains the consumer credit expansions by changes in banks' *willingness* and *ability* to lend to consumers.

⁴Palley (1994) and Hein (2012) are two pioneering studies in the post-Keynesian literature on household debt. See Brochier and Macedo e Silva (2016) for a detailed review of the post-Keynesian literature on household indebtedness and consumption.

⁵See Pollin (1988), Dutt (2006), and Charpe *et al.* (2012) for a discussion of whether demand- or supply-side explanations are more relevant in explaining the growth of household indebtedness. See Stockhammer and Wildauer (2018) for an empirical examination of different theories on the determinants of household debt.

⁶According to Başçı (2006), in the period before the 2001-crisis, high real interest rates and budget deficits led Turkish banks to credit rationing, particularly towards small and medium-sized enterprises (SMEs) and households.

The second departure from the post-Keynesian literature concerns the need to distinguish between structural transformation and structural aggregate demand problems, as recently emphasized by Skott (2021) and Aboobaker and Ugurlu (2020). Economic development represents a process in which the economic structure moves away from low-productivity sectors towards high-productivity sectors. Concomitantly, structural change involves the movement of labor from sectors with the lowest to the highest value-added per worker (Oreiro *et al.*, 2020). Considering that the main obstacle facing developing countries with high levels of open or hidden unemployment is that of structural transformation (Skott, 2021), this paper aims to highlight the limitations of overcoming this obstacle through stimulating domestic demand, in this case via expansion of consumer credit markets.

Finally, given the focus on advanced economies, for which the structural transformation imperatives are less salient, the post-Keynesian literature on household debt uses single-sector models. However, low- and middle-income countries are often characterized by dual labor and goods market structures (Razmi, 2015) meaning that (i) labor constraints have little or no influence on the ability of dual economies to expand output (Skott, 2021) and (ii) a modern/high-productivity-tradable sector exists alongside a traditional/low-productivity/nontradable sector⁷.

The second body of literature this paper relates to empirically links credit expansions with resource misallocations (e.g., Benigno *et al.*, 2015; Borio *et al.*, 2016). This literature shows that credit booms are associated with labor allocation from high to low productivity sectors. A formal model presented by Benigno and Fornaro (2014) illustrates that episodes of abundant access to foreign capital and the accompanying credit expansions result in the allocation of productive sources toward the nontradable sector. In their model, the expansion of the nontradable sector constitutes a problem because this expansion takes place at the expense of the tradable sector due to the full employment assumption. In other words, the movement of an already fully utilized labor into a low-productivity sector lowers the growth potential. The authors motivate their model through the credit boom Spain experienced during the 2000s. While the full employment assumption the authors strongly rely on to generate their results may be appropriate for the Spanish economy, its suitability is questionable for dual economies with high levels of un(der)employed labor. Departure from this assumption is another motivation for the modeling exercise in this paper.

3 Motivation: Consumer Credit Expansion in Turkey

During the 1990s the Turkish economy was marked by chronic inflation, high-interest rates, and unsustainable fiscal deficits. The decade-long macroeconomic volatility and political instability culminated into a major economic crisis in 2001. The economic management cadres, led by the former Vice President of the World Bank Kemal Derviş, announced an IMF-supported program, the aforementioned TSE, to combat the 2001 crisis. This program was fully adopted by the AKP governments and has laid the foundations of

⁷Empirical findings show that labor productivity grows faster in tradable activities, such as manufacturing, as opposed to nontradable activities, such as construction and services (e.g., Benigno *et al.*, 2015). Empirical studies also confirm the idea that structural change and economic growth involve the allocation of resources from low to high productivity sectors (e.g., Diao *et al.*, 2019.)

Turkey's post-2001 growth experience.

The deterioration of the public sector's fiscal balances amidst the high-interest rate environment was one of the main drivers of high inflation rates in the 1990s (Voyvoda & Yeldan, 2005). Therefore, disinflation and fiscal discipline were highlighted as the most important objectives of the TSE program. Attaining primary fiscal surpluses was seen necessary to restore international investors' confidence in the economy and bring inflation under control. With regard to these two objectives, the program was largely successful. The government budget gave a primary surplus of 6 percent of GDP between 2002-2008, and the inflation rate was brought down to single digits in 2004, from an average of 77 percent during the 1990s, and it continued to fluctuate around 8 percent between 2004-2016 (figure 1). The program included other standard IMF measures, such as monetary contraction, adoption of a flexible exchange rate regime, and privatization of state-owned enterprises.

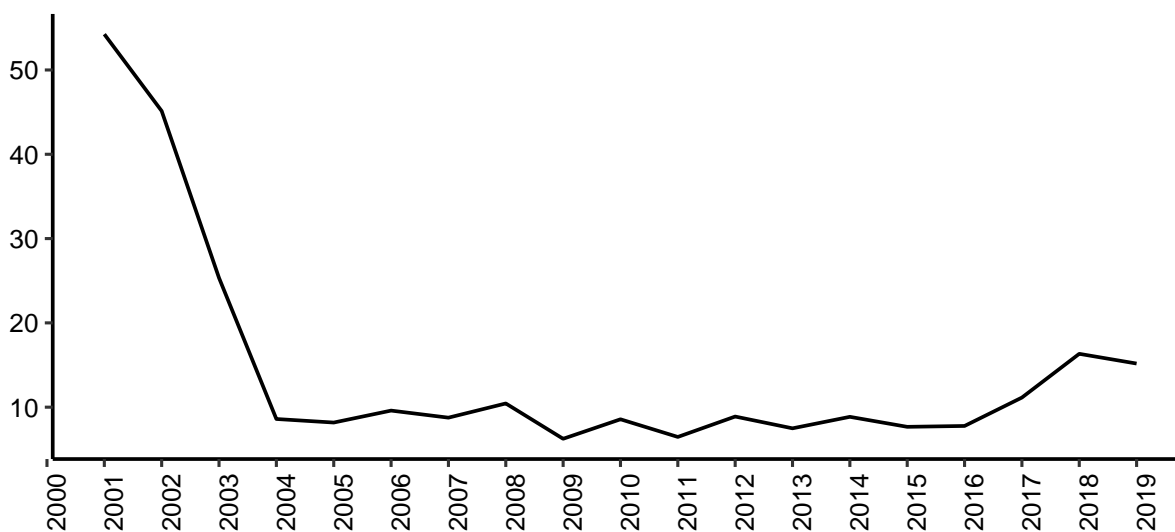


Figure 1: Inflation Rate

Source: IMF, WEO (April, 2020). Note: The inflation rate is calculated as the annual percentage change in average consumer prices.

Given its primary objective of achieving fiscal and inflationary discipline, the TSE program aimed at suppressing wage compensation of public sector employers and restructuring income transfer policies. A group of leading progressive economists organized under the name of 'Independent Social Scientists Alliance' (ISSA), provided a critical assessment of the program where they interpreted these measures as "an attempt creating surpluses to be channeled into exports" (Bağımsız Sosyal Bilimciler, 2001, p. 15). While some measures aimed to repress domestic demand, it is nevertheless hard to interpret the program as supporting an export-led growth strategy given that there was not any roadmap presented to develop the international competitiveness of key export industries. Neither has the program presented an industrial strategy to boost investment

expenditures. As the ISSA critique notes, the word ‘investment’ was used mostly in relation to ‘financial investment’ by foreigners. The lack of a long-run growth strategy and industrialization targets was this program’s major weakness.

Despite its non-negligible shortcomings, the TSE program expressed a legitimate concern that commercial banks were providing too little credit to the private sector given that they were focused on investing in high-yielding government debt instruments. In fact, up until 2001, commercial banks were earning most of their revenues from financing the public deficit by purchasing treasury securities (Karaçimen, 2014). Therefore, as mentioned in the introduction, the TSE program was designed based on the understanding that contracting public expenditures and limiting commercial banks’ purchase of Treasury securities would direct bank lending towards private investment and hence automatically crowd-in investment. There was also the expectation that restoring confidence in international markets and disinflation would enable the reduction of interest rates, which would stimulate consumption and investment.

Meanwhile, during the 2000s, big corporations decreased their reliance on the domestic banking sector due to gaining better access to foreign funding, benefiting from the low international interest rates and excess global liquidity. The appreciation of the Turkish Lira in real terms and fluctuation of the TL/USD nominal rate in the 1.50-1.90 band between 2002-2013, as shown in figure 2, made foreign borrowing even more attractive. The end of an era of profiting off high-interest rates on government bonds accompanied by improved macroeconomic stability encouraged commercial banks to find new sources for profit generation (Karaçimen, 2014). As the corporate sector’s reliance on domestic bank loans also decreased, commercial banks turned towards consumer lending. Banks resorted to various marketing strategies to encourage consumer credit, especially within the segments of the society that were not used to finance their expenditures through borrowing from financial institutions (*ibid.*) As a result, as can be seen from figure 3, the share of household credit as a percentage of GDP started increasing rapidly from 2001 onward⁸. Parallel to this, the share of consumer credit and mortgages increased until 2013, whereas the share of credit allocated to the manufacturing sector declined secularly (figure 3).

Besides commercial banks’ search for new profit avenues, another significant development that supported the growth of consumer markets was the entry of foreign banks into the Turkish banking sector, including some of the biggest global banks such as HSBC and Citibank. The percentage of foreign banks among total banks increased sharply between 2001 and 2007⁹. Even though foreign banks account only for 12% of the domestic loan provision (Baskaya *et al.*, 2017, p. 15), increase in foreign ownership of banking have oriented the Turkish banking sector as a whole towards consumer lending (Ergunes, 2009). The entry of foreign banks facilitates a turn towards consumer lending due to the technological advantages and the know-how on

⁸The increase in liabilities of the household sector was not matched by an increase in their assets. As a result, household leverage ratio increased throughout the 2000s. According to Karaçimen (2014)’s calculations, the ratio of financial liabilities to assets of the household sector increased from 8.5 to 49 percent between 2003 and 2013 (p.4). The share of interest payments in households’ disposable income similarly increased from 2.2. percent to 4.9 percent in the same period (*ibid.*).

⁹According to the Banking Regulation and Supervision Agency (BRSA), as of December 2019, there are 53 banks operating in the Turkish banking sector, 34 deposit banks, 13 development and investment banks, and six participation banks. Among these 53 banks, 21 are foreign owned, where foreign ownership is defined as more than 51 percent of ownership belonging to foreigners.

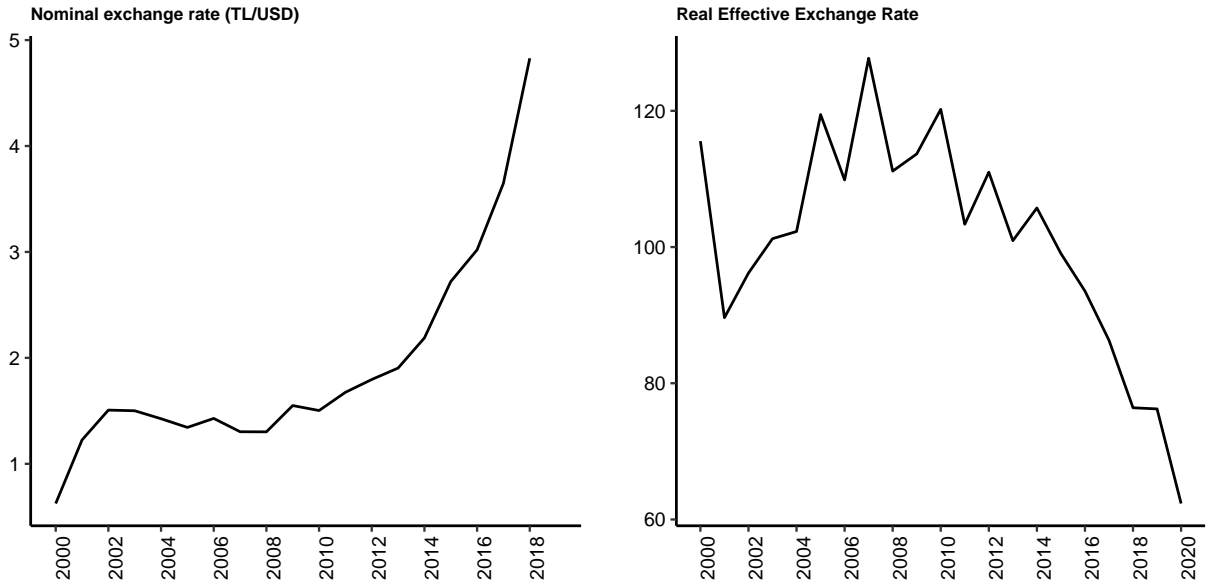


Figure 2: Exchange Rate

Source: Central Bank of Republic of Turkey, Electronic Data Distribution System

consumer lending foreign banks possess. As Lapavitsas and Dos Santos (2008) explain, credit scoring methods require data on the performance of up to 30,000 loans to provide a high degree of statistical confidence. In recent decades, this requirement favored large global banks, such as Citibank and HSBC, which were already specialized in consumer lending in their home countries and therefore possessed data from their pool of previously extended loans. In line with these arguments, figure 3 shows that foreign-owned banks have been allocating a higher share of their loan portfolio to consumer credit and mortgages than domestic banks. According to Ergunes (2009), domestic banks, not wanting to lose their market share to foreign-owned banks, started expanding into consumer credit markets. They adopted aggressive marketing strategies to encourage credit card use, such as offering installment payment plans, loyalty points, and flier miles (Karaçimen, 2015, pp. 121-122). Banks were also in a competition to acquire the rights to direct deposit employee salaries (Karaçimen, 2014, p. 15). Upon reaching an agreement with the employers, banks would offer employees credit cards and personal loans at favorable interest rates. Similar to the *crédito consignado* loans in Brazil, these arrangements between employers, banks, and workers have contributed to consumer credit growth.

The growth of consumer lending was further supported by the intermediation of capital inflows into credit growth through the banking sector (Orhangazi, 2014; Yilmaz and Suslu, 2016). When credit grows faster than retail deposits, as has been happening in Turkey, banks turn to alternative funding sources to meet balance sheet requirements. In the context of the high capital adequacy and liquidity ratios the Turkish banking sector is subjected to, the increase in non-core liabilities, provided by the international capital markets, has filled the gap between credits and deposits (Baskaya *et al.*, 2017, p. 16). By providing cheap funding opportunities by which banks could meet various balance sheet requirements, large banks' access to

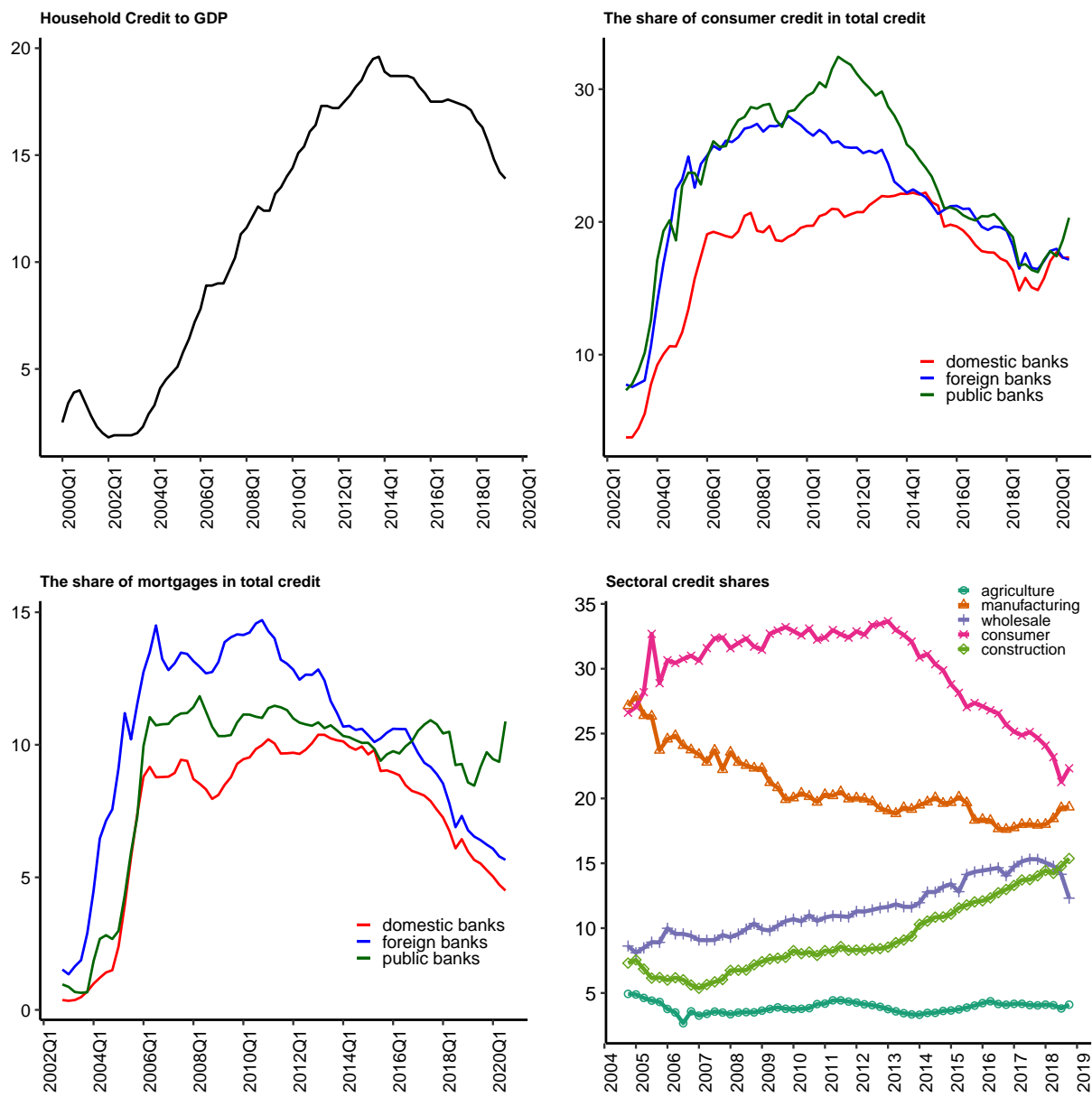


Figure 3: Developments in bank credit in Turkey

Source: Bank for International Settlements, Bank Regulation and Supervision Agency (BRSA) & author's calculations. Note: All ratios are in percentages.

international capital markets supported credit expansion in the Turkish banking sector¹⁰.

Concerning state interventions and regulations in the banking sector, the literature often comments that banking regulation in Turkey has been prudent since 2001 thanks to the measures undertaken following the 2001 crisis. For instance, banks were banned from having currency mismatches, foreign currency loans to consumers were prohibited, and to firms, it was highly restricted. However, as Hakan Kara, the former chief economist of the Central Bank, notes the Banking Regulation and Supervision Agency lacked a macroeconomic perspective as it focused exclusively on the health of individual banks (Kara, 2016) without controlling the composition of credit and the growth of consumer loans. While the upward trend in consumer loans started reversing around 2013 due to the Fed’s tapering signal, the growth of consumer loans was not addressed by policymakers until March 2020, when the Central Bank introduced a set of changes to reserve requirements to limit the rise in consumer loans and channel loan supply towards more productive and production-oriented sectors (CBRT, 2020).

Between 2002-7, the major state interventions in the consumer credit markets took place through parliamentary legislation with the aim of promoting the expansion of mortgage markets (Kahraman, 2017). In the case of consumer credit (excluding mortgages), the state avoided significant interventions. This choice has ultimately resulted in an autonomous proliferation of credit card usage (*ibid.*, p.107). On the other hand, the state played a more active role in promoting the growth of mortgage markets. Before the 2000s, there was no comprehensive housing finance system that connected financial institutions to home buyers. In 2007, the parliament enacted the “Housing Finance Law,” which introduced the mortgage system in Turkey, enabling banks to provide long-term low-interest rate housing credits to consumers. This legislation provided longer maturity funding opportunities to banks to encourage the growth of mortgage credits. It also allowed the purchased dwelling units to be used as collateral for loans, including measures to shorten the foreclosure process in the case of defaults, introduced complementary institutions such as real estate appraisal services, and defined the legal ground for the introduction of mortgage-back capital market instruments and secondary market institutions (Erol, 2018, pp. 259-261). The advent of the mortgage system contributed significantly to the growth of housing loans (Yeşilbağ, 2020).

Any analysis of the growth of consumer lending, particularly mortgage lending, in Turkey would be incomplete without discussing the strategic importance assigned to the construction sector during the AKP era. The AKP governments have made a strategic choice to promote the construction sector due to its ‘potential to stimulate the economy’, create jobs, and win loyalty at the ballot box through increased homeownership (Yeşilbağ, 2020). One of the ways by which the government promoted the construction sector’s growth was to engage in massive construction projects, including Erdoğan’s so-called “crazy project,” which is projected to split the European side of Istanbul with an artificial canal parallel to Bosphorus and opening the idle land

¹⁰An empirical study by Baskaya *et al.* (2017), using bank and firm-level data from Turkey, examines the links between international capital flows, decomposed into bank and non-bank flows, and domestic credit market. After controlling for unobserved and time-varying firm characteristics that might be correlated with credit demand, the authors analyze how domestic banks’ borrowing from international capital markets influence their credit supply. Their findings indicate that large domestic banks with strong access to international capital markets used cheap borrowing opportunities during periods of low interest rates in advanced economies, as reflected in their non-core liability ratios.

around it for construction and rent generation. The rents created in these projects have been successfully shared between a new generation of construction firms with organic links to the ruling party and the party officials (Akçay, 2017). It should be highlighted that all the mega projects are in nontradable activities, particularly construction, and they reveal the sectoral preferences of the government with respect to generating economic growth (Günçavdı & Ülengin, 2017).

To summarize, the restructuring of macroeconomic policies under an IMF-supported austerity program limited the government's ability to stimulate domestic demand through expansionary fiscal and monetary policy. Consumer credit expansions, enabled and encouraged by the fiscal and banking reforms that were part of the TSE program and subsequent banking regulations, functioned as a compensation mechanism to fill this vacuum. Decreasing reliance of the corporate sector on domestic borrowing, the increasing presence of foreign banks and strategic importance assigned to the construction sector oriented the banking sector towards lending to households further¹¹. In the meantime, the banking sector played an active role in intermediating global financial inflows into domestic credit expansion. These developments resulted in a remarkable increase in the consumer credit to GDP ratio (figure 3).

One of the natural consequences of the expansion of consumer credit has been high growth rates in final consumption expenditures, excluding the crisis years (figure 4). However, the stimulation of private consumption expenditures, together with the appreciation of the domestic currency, contributed to the deterioration in the current account deficit observed since 2001 (figure 4). While current account deficits have been a feature of the Turkish economy even before the 2000s, particularly since the liberalization of trade and financial flows in the 1980s, these deficits were usually small (Orhangazi & Yeldan, 2021) and started deteriorating significantly only after the implementation of the TSE program¹².

¹¹While policy induced supply-side drivers are the main focus of this paper, certain demand side factors also contributed to consumer credit expansions. For instance, decreasing inflation rates and interest rates on consumer loans encouraged consumers to realize their consumption demands that they had deferred due to the 2001 crisis (Başçı, 2006). The stagnation of real wages and the dismantling of organized labor, through new labor laws introduced in 2003, contributed to households' demand for consumer loans further (Karaçimen, 2014, p. 2)

¹²The current account deficit to GDP ratio did not exceed one percent throughout the 1990s, it averaged 4.61 percent between 2002-2013, and reached as high as 9 percent in 2012.

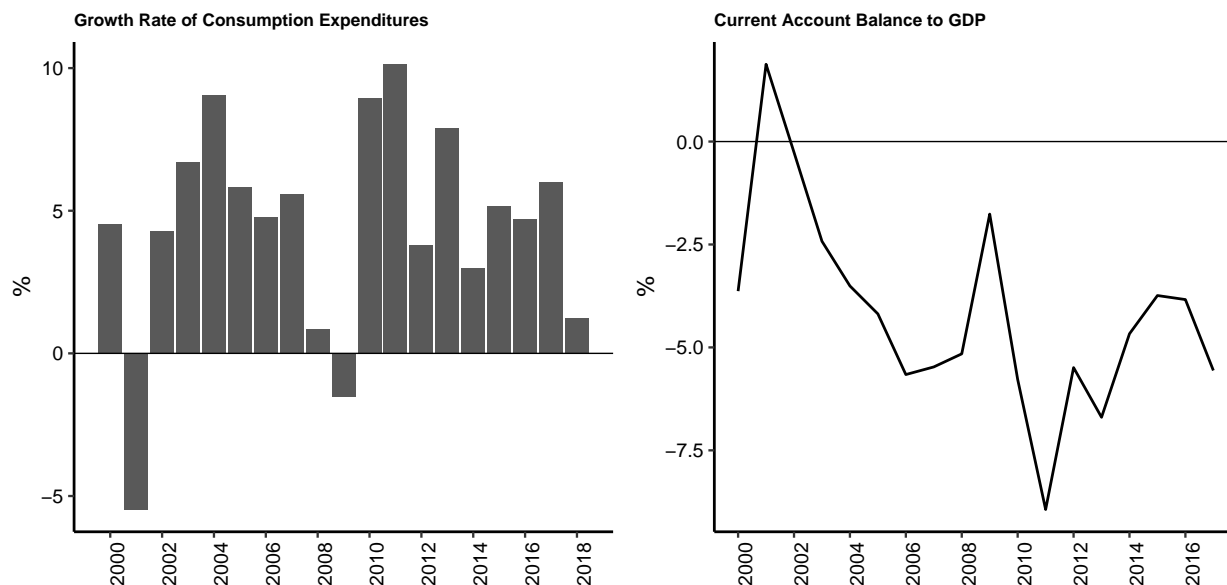


Figure 4: Consumption Expenditures and Current Account Balance

Source: Central Bank of Republic of Turkey, Electronic Data Distribution System

Despite generating high growth rate during the 2000s (7.2 percent between 2002-2006; figure 5), the consumer credit-fueled growth strategy¹³ has led to a buildup of imbalances and fragilities, such as balance sheet fragilities for firms and households, an overvalued real exchange rate, persistent current account deficits, and sectoral changes favoring low-productivity growth sectors. Most importantly, this growth strategy lacked a sound industrial policy as short-term gains enabled by an overvalued real exchange rate undermined the industrial base of the economy in the long run (*ibid.*). This short-sighted macroeconomic perspective started running into a crisis following the ‘taper tantrum’ signal by the Fed in 2013¹⁴, which indicated a change in global liquidity conditions and led to a major slowdown in capital inflows to emerging markets. As figure 5 illustrates, the GDP growth started exhibiting a declining trend since 2013.

¹³The conceptualization of Turkey’s growth strategy/model as being credit/debt-led is shared by some other scholars. For instance, Akçay *et al.* (2021), in a study examining the demand regimes of eight emerging capitalist economies, define Turkey’s growth regime between 2000 and 2019 as “debt-led private demand regime.” According to Akçay *et al.*, the defining characteristics of this demand regime are (i) “negative or close to zero financial balances of the private household sector”, (ii) positive financial balances of the external sector (i.e., current account deficits), and (iii) the role of private consumption in driving growth (p. 6).

¹⁴Political tensions that took place starting in this period also posed challenges to the growth strategy that was followed between 2002-2013. This paper abstains from these discussions. Interested readers can refer to Akçay (2021).

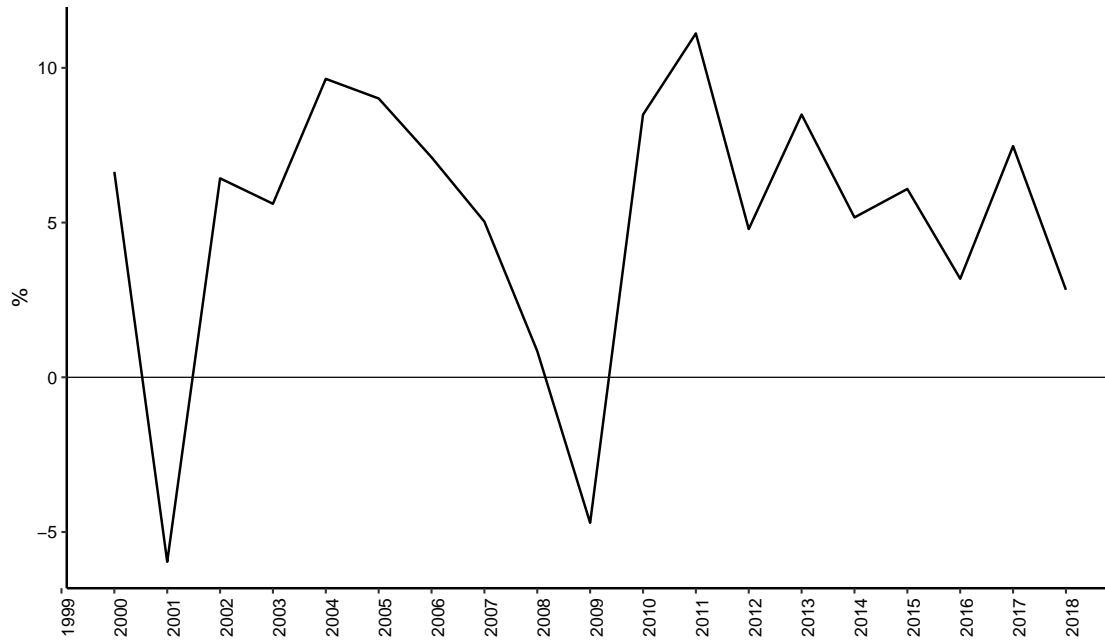


Figure 5: GDP Growth

Source: IMF, World Economic Indicators (April 2020)

With regard to sectoral developments, a prolonged period of overvalued real exchange rate, as depicted in figure 2, promoted the use of imported intermediate goods across many sectors while resulting in the loss of export competitiveness (*ibid.*). The end result was a case of *premature de-industrialization* indicated for instance by the secular increase in the ratio of construction sector output to manufacturing output (figure 6). The ratio of construction sector value added to GDP increased from 5 to 9 percent between 2002-2013, whereas the share of manufacturing and services value added fluctuated around 18 percent and 60 percent respectively. In other words, the production structure of the Turkish economy moved away from tradable industries towards the nontradable sector (Can *et al.*, 2016). Parallel to these developments, the nontradable to tradable sector employment increased significantly (figure 6).

Although the primary focus of this paper is on consumer credit markets, developments in the sectoral composition of firm credit should also be highlighted to explain the expansion of the nontradable sector. The micro-econometric evidence on Turkey, presented by Günay and Kılınç (2015), shows that the nontradable sector firms were more financially constrained than the tradable sector ones between 1970 and 2004. This result is not surprising considering that bank credit is a major source of external finance for nontradable sector firms, whereas many tradable sector firms have access to international capital markets, given that they can pledge export receivable as collateral. Therefore, the nontradable sector is more sensitive to changes in banks' lending standards than the tradable sector (Tornell and Westermann, 2002). In light of this evidence, it is possible to interpret the rise of the nontradable sector output, particularly of the construction sector, in relation to the rise in credit availability to this sector, as indicated in figure 3.

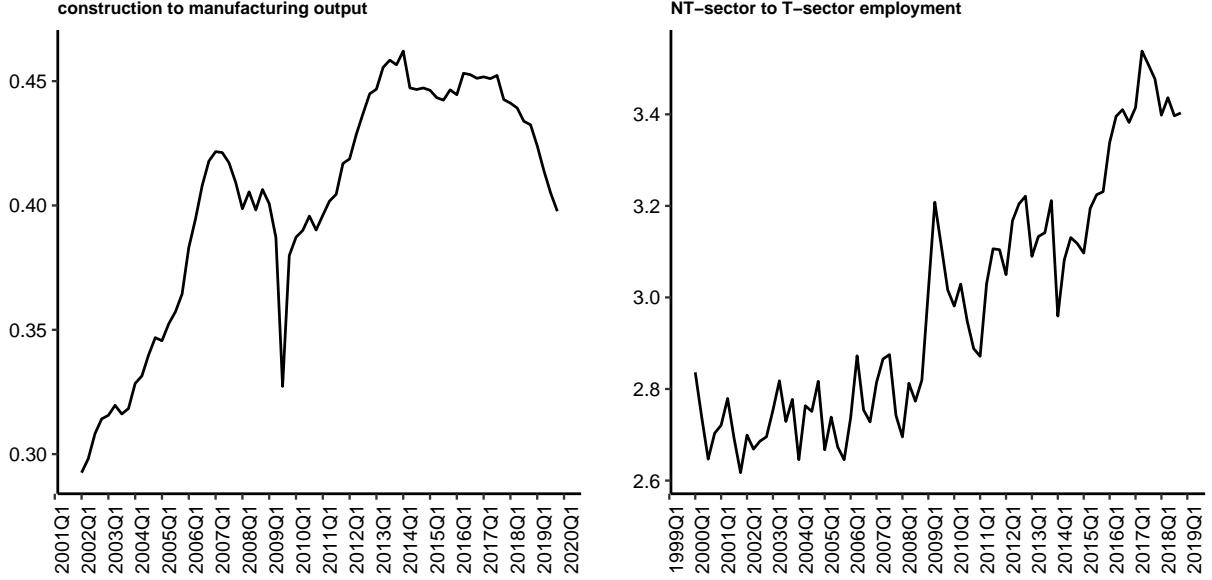


Figure 6: Output and Employment Ratios

Source: Turkish Statistical Institute (TUIK) & author's calculations

Based on the descriptive account of the Turkish economy presented in this section, the next section will develop a two-sector open economy model to analyze the macroeconomic and sectoral effects of consumer credit expansions. One of the key points that need to be captured in the formal model is that consumer credit expansions were largely policy driven. Secondly, consumer credit expansions were accompanied by the appreciation of the real exchange rate, deterioration of the current account balance, and the expansion of the nontradable sector at the expense of the tradable sector.

4 The Model

4.1 Production

The economy under consideration consists of two sectors: a tradable (T-sector) and a nontradable sector (N-sector). The tradable sector produces output Y_T using modern production techniques, and labor exhibits high productivity. The output of this sector can be exported or used for domestic consumption. The production is characterized by a Leontief production function. The capital coefficient is taken to be constant.

$$Y_T = \min\{\bar{\sigma}K, AL_T\} = \sigma K = AL_T \quad \sigma \leq \bar{\sigma} \quad (1)$$

The nontradable sector produces output Y_N using labor as the only input. This assumption reflects the stylized observation that capital intensity is lower in the production of nontradable goods. Equation 2 gives the production function for the nontradable sector, where e denotes the employment rate in the nontradable

sector and unemployment, $1 - e$, can take the form of open or hidden unemployment.

$$Y_N = BeL_N \quad (2)$$

Labor is assumed to be mobile across sectors. Workers prefer to be employed in the T-sector, and those who cannot find jobs in the T-sector move into the N-sector.

$$L = L_T + L_{NT} \quad (3)$$

Using equation 3, equation 2 can be re-written as:

$$Y_N = BeL_N = Be(L - L_T) = BeL(1 - \frac{\sigma K}{AL}) = BeL(1 - \sigma\lambda) \quad (4)$$

where λ is given by:

$$\lambda = \frac{K}{AL} \quad (5)$$

4.2 Wages and Prices

Nominal wages in the T-sector, w_T , are predetermined. Assuming a constant mark-up, prices in the T-sector are also predetermined. Therefore, profit share is given by:

$$\pi = 1 - \frac{w_T}{Ap_T} \quad (6)$$

The nontradable sector is characterized by income/work sharing¹⁵. The average income (wage) in the N-sector is therefore given by total income divided by the number of workers not employed in the tradable sector.

$$w_N = p_N \frac{Y_N}{L_N} = p_N Be \quad (7)$$

While aggregate income in the N-sector is demand determined, whether the increase $p_N Y_N$ results from an increase in p_N or Y_N is indeterminate. A higher demand for N-goods can i) increase p_N , ii) reduce the rate of unemployment and raise Y_N , iii) or some combination of two might take place. Regardless of the specific channel by which a higher demand for N-goods translates into a higher $p_N Y_N$, an increase in N-sector incomes would result in wage inflation in the T-sector if workers in this sector respond to higher average incomes in the N-sector by demanding an increase in their wages.

Following Martins and Skott (2021), the specification for wage inflation in the T-sector incorporates relative wage norms whereby an increase in the N-sector income triggers upward pressures on T-sector wages. This is represented by:

$$\hat{w}_T = f\left(\frac{w^O}{w_T} - 1\right), \quad f(0) = 0, \quad f' > 0 \quad (8)$$

¹⁵Income sharing is a common assumption employed in dual economy models. See, for instance, Razmi *et al.* (2012).

where w^O is the target (objective) wage rate of T-sector workers, which is proportional to average income in the N-sector (equation 9). The target level of wage can be interpreted in relation to the norms of fairness. Equation 9 shows that the target wage rate in the T-sector is higher than average incomes in the N-sector ($\mu > 1$). Firms can be expected to pay a wage premium under the standard rationales of efficiency wage theory (Martins and Skott, 2021). The non-negative wage premium is also a common assumption in dual sector models in the tradition of Lewis (1954)¹⁶.

$$w^O = \mu w_N, \quad \mu > 1 \quad (9)$$

4.3 Banking Behaviour and Debt Dynamics

A skeletal banking system is assumed. All foreign (net) capital inflows take the form of changes in foreign held deposits in domestic banks. All foreign deposits are held in domestic currency. Domestic firms are owned by capitalists, who also receive interest income on their bank deposits. Equation 10 shows that total loans, divided into loans given to workers and capitalist, and deposits, by foreigners and capitalists, are equal, which means that banks have no reserves. With interest rates on borrowing and lending are being the same¹⁷, banks have zero profits. Accounting relations on the model are summarized in table 1.

$$D^w + D^C = M^F + M^C \quad (10)$$

Workers take on debt for consumption purposes whereas capitalists borrow to finance investment spending¹⁸. Firms'/capitalists' finance constraint is given by equation 11. This equation suggests that for capital accumulation to exceed internal funds and interest income net of interest payments on debt, and deposits, it needs to be financed by new borrowing.

$$p_K I = s(\pi p_T Y_T - i D^C + i M^C) + \dot{D}^C - \dot{M}^C \quad (11)$$

A key assumption of the model is that workers are subject to credit rationing; therefore, consumer credit expansions are explained by changes in banks' willingness and ability to lend to households. There are no constraints on total amount of loans that can be borrowed by firms. Equation 12 expresses the change in workers' debt as a function of the target level of lending (to workers) as determined by banks, D^T , and actual stock of workers' debt, D^w , where θ is a positive constant. This specification of debt dynamics has

¹⁶Formulating a target wage rate shares affinities with the post-Keynesian conflicting claims theory of inflation (Rowthorn, 1977). In this theory, the general price level comprises various cost components whereby each interest group receiving income from these components comes into conflict to increase their relative income shares. Given the assumption of constant labor productivity employed in this paper, we can think of demanding a desired functional distribution versus a desired real wage as being the same. It should also be noted that besides the N-sector wages, the employment rate in the T-sector is likely to influence the target wage rate as it shapes workers' perceptions of their bargaining power (Porcile & Lima, 2010). However, this paper abstains from this aspect of wage setting to keep the formal analysis easily tractable.

¹⁷Credit rationing suggests that banks find lending to households risky, and they expect some households to default. As such, it might be unreasonable to expect the interest rates on lending and borrowing to be the same. We could introduce an interest rate spread; however, qualitative results would not change as long as banks are owned by domestic capitalists, and any profits are paid out to them as dividends. This is because whether capitalists earn interest income on their deposits or earn dividend income does not change their consumption behavior.

¹⁸For this reason, the terms 'workers' debt' and 'consumer debt' are used interchangeably.

some affinities with Dutt (2006) and Ryoo and Kim (2013).

$$\dot{D}^W = \theta(D^T - D^w) \quad (12)$$

The target level of lending reflects banks' willingness and ability to give consumer loans. As explained in section 3, the policy induced transformations in government financing and banking sector in Turkey in the aftermath of the 2001 crisis have led to diversification banking activities towards consumer lending. Changes in the target level of lending towards consumer reflect this sort of policy-induced increases in borrowing opportunities faced by consumers.

The change in foreign deposits is given by equation 13.

$$\dot{M}^F = iM^F - NX \quad (13)$$

With regard to central banking behavior, I assume that the central bank adopts an inflation-targeting framework, where interest rate is used as a tool to keep inflation under control. As such, whenever there is an upward pressure on the general price level, the central bank increases the interest rate to keep inflation at a targeted rate. This assumption is in line with the central banking practices most developing countries, including Turkey, have adopted since the early 2000s.

	Workers	Capitalists	Banks	External	Total
Fixed Capital		$p_K K$			$p_K K$
Loans	$-D^W$	$-D^C$	$D^W + D^C$		0
Deposits		$+M^C$	$-M^C - M^F$	M^F	0
Sum	$-D^W$	$p_K K - D^C + M^C$	$D^W + D^C - M^C - M^F$	M^F	$p_K K$

Table 1: Balance Sheet Matrix

4.4 Demand

Aggregate consumption is divided into three components: i) demand for domestically produced tradable goods, ii) demand for nontradable goods, and iii) demand for foreign produced tradable goods. All nontradable income is spent on consumption. Similarly, wage earners in the T-sector consume all their earnings plus their borrowing, represented by \dot{D}^W , net of interest payments on their total stock of debt. In line with the standard structuralist and Kaleckian literature, I assume that capitalists save a fraction of s of total profits, πY_T , where π denotes the profit share. Capitalists spend a proportion of their profit income plus their net interest earnings, on consumption.

$$pC = p_N C_N + p_T C_T + np^* C_{IM} = p_N Y_N + (1 - \pi)p_T Y_T + \dot{D}^W - iD^W + (1 - s)(\pi p_T Y_T - iD^C + iM^C) \quad (14)$$

Each of the three goods receive a fixed share of total domestic spending on consumption, corresponding to

a Cobb-Douglas utility function¹⁹. Equations 15-17 show that a proportion α of total consumption demand goes to nontradable goods, while the rest $1 - \alpha$ goes to the tradable goods. The demand for tradable goods is divided between domestically and foreign produced goods, with shares $1 - \psi$ and ψ respectively.

$$p_N C_N = \alpha p C \quad (15)$$

$$p_T C_T = (1 - \psi)(1 - \alpha)p C \quad (16)$$

$$n p^* C_{IM} = \psi(1 - \alpha)p C \quad (17)$$

The nominal exchange rate, n , is defined as the number of units of domestic currency required to buy one unit of foreign currency. Hence, an increase in n corresponds to a depreciation of the domestic currency. Following Martins and Skott's (2021) formalization that relies on standard interest parity arguments, the nominal exchange rate is represented as a function of domestic interest rate, foreign interest rate, expectations of future exchange rate, and risk considerations that are independent of exchange rate expectations (equation 18). The expected exchange rate and the risk premium can change in response to any domestic or international macroeconomic shock. Foreign prices, p^* , are taken as exogenous.

$$n = n(i, i^*, E^n, \tau) \quad (18)$$

The real exchange rate (η) is defined as the relative price of foreign and domestically produced goods in domestic currency:

$$\eta = \frac{n p^*}{p_T} = \frac{n(i, i^*, E^n, \tau) p^*}{p_T} = \eta(i, i^*, E^n, \tau, \frac{p^*}{p_T})$$

By subsuming τ , i^* , E^n , and $\frac{p^*}{p_T}$ into the shift variable ρ , the real exchange rate is given by equation 19.

$$\eta = \eta(i, \rho); \quad \eta_i < 0, \quad \eta_\rho > 0 \quad (19)$$

Investment requires both domestic tradable goods and imported goods, with strict complementarity²⁰. Real investment is given by:

$$I = \min\left\{\frac{I_T}{\beta}, \frac{I_{IM}}{1 - \beta}\right\} \quad (20)$$

Nominal investment is given by:

$$p_K I = [\beta p_T + (1 - \beta)n p^*] I \quad (21)$$

¹⁹The assumption of fixed consumption shares is a reasonable approximation for the short and medium run (Skott & Gómez-Ramírez, 2018). However, a long run extension of the model would need to relax this assumption (see, e.g., Razmi *et al.*, 2012). Section 4.7 discusses the implications of relaxing this assumption.

²⁰In the model, while domestically produced and imported goods are substitutes in consumption, they are complements in investment. This assumption is a stylized representation where the home country is importing sophisticated investment goods, such as machinery and equipment, that are essential but cannot be produced domestically.

Investment behavior is given by equation 22 with output-capital ratio, which is used as an indicator of capacity utilization, being the only argument. The sensitivity of investment to changes in utilization, given by a_1 , is likely to depend on the time frame under consideration. Given that the sensitivity is likely to be low in the short run, I assume that the Keynesian stability condition is satisfied in the short run, meaning that the saving rate responds more to changes in the capacity utilization than investment.

$$\frac{I}{K} = a + a_1\sigma \quad (22)$$

Equation 23 shows that exports depend positively on the real exchange rate. The effect of foreign income on exports is omitted. Net exports are given by equation 24 where imported goods used for investment and consumption of imported tradable goods are deducted from exports.

$$p_T X = p_T \phi(\eta), \quad \phi'(\eta) > 0 \quad (23)$$

$$NX = p_T X - np^*(1 - \beta)I - \psi(1 - \alpha)pC \quad (24)$$

4.5 Equilibrium

Using equations 4, 14 and 15, the equilibrium condition for the N-sector can be expressed as:

$$p_N Y_N = p_N B e L (1 - \sigma \lambda) = p_N C_N = \alpha p C \quad (25)$$

With a fixed mark-up, a successful inflation targeting requires a constant wage inflation. This in turn requires that 1) the actual wage in the T-sector is equal to the target wage, and 2) there is a fixed relationship between the wages in the two sectors. These two conditions can be summarized as:

$$w_T = w^O = \mu w_N \quad (26)$$

Using equations 6, 7, and 26, equation 25 can be solved for T-sector output-capital ratio, which is given by equation 27a (see appendix A for intermediate steps).

$$\sigma = \frac{1}{\left[\frac{B}{A} + \frac{\alpha}{(1-\alpha)}(1-s\pi)\frac{B\mu}{A(1-\pi)} \right]} \left\{ \frac{B}{A\lambda} - \frac{\alpha}{(1-\alpha)} \frac{B\mu}{A(1-\pi)} \frac{\dot{D}^W}{p_T K} + \frac{\alpha}{(1-\alpha)} \frac{B\mu}{A(1-\pi)} \frac{[sD^W + (1-s)M^F]i}{p_T K} \right\} \quad (27a)$$

Equation 27a expresses the value of σ that is consistent with the assumption of constant inflation as a function of \dot{D}^W , i and a set of exogenous and predetermined variables. Looking at the partial derivatives, we can establish that this equation expresses σ as an increasing function of i and as a decreasing function of \dot{D}^W . Equation 27a can be written in implicit form as:

$$G(\sigma, i, \dot{D}^W) = 0 \quad G_1 > 0, \quad G_2 < 0, \quad G_3 > 0 \quad (27b)$$

So far, we have looked at the equilibrium condition for the N-sector. We also need to take the equilibrium

condition for the T-sector, which is given by:

$$p_T Y_T = p_T C_T + p_T I_T + p_T X_T = (1 - \psi)(1 - \alpha)pC + p_T \beta I + p_T \phi(\eta) \quad (28)$$

Solving this equation for output-capital ratio yields (see appendix B for intermediate steps):

$$\sigma = \frac{1}{1 - (1 - \psi)(1 - s\pi) - \beta a_1} \left\{ (1 - \psi) \left(\frac{\dot{D}^W}{p_T K} - \frac{[sD^W + (1 - s)M^F] i}{p_T K} \right) + \beta a + \frac{\phi(\eta)}{K} \right\} \quad (29a)$$

Equation 29a expresses σ as a decreasing function of i and an increasing function of \dot{D}^W . This equation can also be rewritten in implicit form as:

$$H(\sigma, i, \dot{D}^W) = 0 \quad H_1 > 0, \quad H_2 > 0, \quad H_3 < 0 \quad (29b)$$

We now have two equations (equation 27b and 29b) that we can use to determine the two endogenous variables of the model, σ and i .

4.6 Comparative Statics

The effects of household credit expansion on tradable sector output

The partial derivative of equilibrium value of σ (represented by σ^*) with respect to \dot{D}^W is negative provided that i) the real exchange rate is interest elastic, and ii) Marshall-Lerner condition holds (see appendix C for the derivation of this result).

$$\frac{d\sigma^*}{d\dot{D}^W} < 0 \quad (30)$$

Intuitively, when there is new borrowing by households, the total consumption demand increases, a portion α of which feeds into the N-sector. Higher demand for N-goods translates into an increase in $p_N Y_N$, representing an increase in the average incomes in this sector. Given that the target wage rate in the T-sector exceeds average incomes in the N-sector (i.e., $\mu > 0$), an increase in N-sector average incomes puts upward pressure on T-sector wages. With mark-up pricing, wage pressures in the T-sector translate into inflationary pressures. Under an inflation targeting framework, the central bank would raise the interest rate to contain the rise in domestic prices. This intervention causes an appreciation of the nominal, and hence the real exchange rate (η falls, equation 19). This results in a reduction in exports. As a result, the tradable sector output shrinks.

The effects of household credit expansion on nontradable sector output

From equation 4, we have: $p_N Y_N = p_N B e L (1 - \sigma \lambda)$. Given the constancy of $p_N e$, B , L and λ , we can see that $p_N Y_N$ would unambiguously increase as an increase in \dot{D}^W causes σ to decline, as given by equation 27.

The effects of household credit expansion on net exports

Net exports were given by:

$$\begin{aligned}
NX &= p_T X - np^*(1 - \beta)I - \psi(1 - \alpha)pC \\
&= p_T \phi(\eta) - np^*(1 - \beta)K(a + a_1\sigma) - \psi(1 - \alpha)pC
\end{aligned}$$

Without restrictions on some of the parameters, the net effect on net exports appears to be ambiguous. The effect of a rise in \dot{D}^W is likely to be negative for small values of β , if the sensitivity of accumulation to changes in output (a_1) is high, and the share of consumption going to imported tradable goods is high.

Before concluding the formal analysis, it should be noted that this set up is stock-flow consistent in the sense that the balance sheet condition for the banking sector is maintained over time for any value of \dot{D}^W by the financial flows that the model determines (i.e., $\dot{M}^F + \dot{M}^C = \dot{D}^W + \dot{D}^C$). (See appendix D for a formal proof.)

4.7 Discussion

The model presented above captures five key developments that are documented in section 3. It shows that 1) policy changes that increase banks' willingness and ability to lend trigger expansions in consumer credit. New consumer lending, in turn, accompanies 2) appreciation of the real exchange rate, 3) deterioration of the current account balance, 4) a decline in the T-sector output, and 5) an increase in the N-sector output. The model generates these results in a short-run setting. However, an analysis of structural transformation necessitates a long-run perspective. As the proceeding qualitative analysis shows, several factors point that the adverse effects of consumer credit expansions on the T-sector are likely to strengthen in the long run.

To analyze the long-run implications, we can first discuss how investment behavior would be expected to change in the long run. If we take an Harrodian perspective, we can expect deviations between the actual and the desired utilization rate due to the slow nature of adjustments in capital stock in the short run. However, in the long run, firms target a desired utilization rate compatible with their profit maximization goal. As a result, they adjust their capital accumulation when there are under or over-utilized capacities. If firms have persistent unwanted excess capacity, they will react by reducing investment. In terms of the formal model presented in this paper, taking the Harrodian dynamics into account suggests that a contraction in T-sector capacity utilization might affect investment much more dramatically than suggested by the short-run specification as firms react to the shrinking divergence between the actual and targeted rate of utilization by decreasing their investment further.

Changes in labor productivity is another aspect that requires attention in the long run. The model presented above assumed a fixed coefficient production function for the T-sector. While this choice is reasonable in the short-run, labor productivity would be expected to depend positively on the rate of accumulation (i.e., the growth rate of output in the T-sector) in the medium to long-run, corresponding to the Verdoorn effect. This suggests that when productivity gains are taken into consideration, consumer credit expansion could result in a fall in labor productivity in the T-sector through a lower accumulation rate. Furthermore, if increasing returns to scale is introduced in the T-sector, consumer credit expansions could push an economy

into a deindustrialization trap²¹.

Another assumption that would need to be relaxed for a long-run analysis is the assumption of constant consumption shares. The model assumed that households spend a constant proportion of their income on domestically and foreign-produced tradable goods, with shares $1 - \psi$ and ψ respectively. In the medium to long run, these shares likely respond to changes in the real exchange rate, whereby households spend a greater proportion of their income on imported tradable goods following an appreciation. Once this effect is taken into consideration, the effect of consumer credit expansion on the current account deficit is likely to be larger.

The analysis so far has abstained from imported intermediate inputs to keep the formal model tractable. Nevertheless, a few remarks can still be made. Whether incorporation of intermediate inputs alters the model's conclusions or not depends on how RER appreciation generated by household credit expansion affects the constant inflation constraint. The RER appreciation would lower the general price level by cheapening imported consumption goods and non-labor input costs. With fixed mark-up, the decline in the price level would translate into a larger wage share. However, if the proportion of wages in the two sectors do not change (i.e., if wages in the two sectors increase by the same proportion following the appreciation), then the introduction of intermediate inputs would not be expected to change the qualitative results of the model given that the central bank does not change its policy rate in the case of a constant wage inflation.

Another key factor that is likely to worsen the long-run implications is the balance of payments effects. The boost to aggregate demand, coupled with the real exchange rate appreciation, is likely to trigger unsustainable trade deficits and drag economic growth. Sustained appreciation of the RER could have additional detrimental consequences in the long run if it changes the incentive structure of domestic producers by making them more reliant on imported inputs; hence, making the balance of payments constraint more binding. In other words, even if RER appreciation could dampen inflation and raise living standards in the short run, it can alter the incentive structures of producers and deteriorate the balance of payments over the long-run.

5 Conclusion

This paper aimed to present a two-sector open economy growth model to analyze how policy-induced expansions in consumer credit can generate premature deindustrialization when borrowing constraints consumers were previously subjected to are lifted and an inflation-targeting regime is in place. The model is inspired by the Turkish economy, which has experienced a significant increase in consumer credit to GDP ratio between 2002 and 2019. Changes in the fiscal policy and the banking sector after the 2001 economic crisis, coupled with favorable international financial conditions, oriented the Turkish banking sector towards consumer lending. Although credit-financed consumption contributed to high growth rates in the short-run through stimulating domestic aggregate demand, this process was accompanied by the build-up of several imbalances, such as the appreciation of the real exchange rate, expansion of the current account deficit, and deterioration

²¹This argument shares affinities with the literature on resource curse. See Skott (2021) for a formalization of how a temporary oil boom can lead to permanent deindustrialization. Benigno *et al.* (2015) make a case for “financial resource curse” in the case of abundant access to foreign capital coupled with weak productivity growth.

of the sectoral structure.

While the literature on consumer debt has proliferated in recent years, there have not been any attempts to evaluate the implications of credit-financed consumption in dual economies using a formal model. The lack of attention given to developing countries in the post-Keynesian literature on consumer debt, coupled with the need to evaluate the weaknesses of credit-fueled growth strategies, motivated the modelling exercise in this paper. The main contribution of this paper hence lies in the development of a dual economy model that depicts a specific mechanism by which consumer credit expansions can generate undesirable macroeconomic and sectoral outcomes in countries with high levels of un(der)employed labor.

The paper also aimed to present a critique of the short-termism of growth strategies Turkey adopted in recent decades. The political economy analysis of post-2001's Turkey indicates that credit-financed consumption, coupled with nontradable sector investments and overvalued currency, was used as populist measures by the AKP governments to generate short-term economic gains and political support. The formal model presented in this paper illustrated that such populist measures are not compatible with successful industrialization. Future policy ought to be structured around a different set of premises if Turkey is to realize a more sustainable development path.

Before ending the paper, a few caveats should also be mentioned. Firstly, the financial side of the model is kept relatively simple. The model does not distinguish between different types of capital inflows, such as bond flows or equity flows. Financial inflows take the form of changes in deposits held by foreigners in domestic banks. Examining how domestic credit expansion interact with different types of capital inflows can be a helpful direction for future research²². Meanwhile, foreign currency-denominated assets and liabilities in the balance sheet of the banking sector are assumed away. Therefore, the model does not allow to examine balance sheet mismatches in the banking sector that could arise from movements in the real exchange rate. Secondly, the model does not feature credit constraints faced by firms. However, as discussed in section three, the empirical evidence on Turkey indicates that SMEs, particularly those operating in the nontradable sector, face borrowing constraints (Günay & Kılınc, 2015). Future formal modeling exercises could take these asymmetries into consideration. Fiscal policy and industrial policy are not incorporated into the model²³.

Finally, it should be noted that while the formal model is inspired by the Turkish experience, its conclusions apply to other developing countries that underwent significant expansions in household credit and premature deindustrialization. The general policy conclusions that can be drawn from this paper, which echoes Martins and Skott (2021), is that aggregate demand policy should focus on creating a stable macroeconomic environment that encourages and supports the expansion of high-productivity activities, which are typically associated with the tradable sector, without undermining productive capacity and causing unsustainable imbalances, particularly with respect to real exchange rate alignment and balance of payments.

²²See Razmi (2016, 2021) for an analysis of how different types of capital inflows interact with macroeconomic and sectoral outcomes under different exchange rate regimes using the Portfolio Balance Framework.

²³See Skott (2021) for a discussion of fiscal policy in a dual economy.

Appendix A: Nontradable sector equilibrium

$$p_N Y_N = p_N B e L (1 - \sigma \lambda) = p_N C_N = \alpha p C \quad (\text{A1})$$

Solving equation 25 (A1) for tradable sector output-capital ratio yields:

$$p_N Y_N = \alpha \left[p_N Y_N + (1 - \pi) p_T Y_T + \dot{D}^W - i D^W + (1 - s) (\pi p_T Y_T - i D^C + i M^C) \right] \quad (\text{A2})$$

Re-arranging the terms and using equation 10:

$$(1 - \alpha) p_N Y_N = \alpha \left[(1 - s \pi) p_T Y_T + \dot{D}^W - s i D^W - (1 - s) i M^F \right] \quad (\text{A3})$$

Using equation 4:

$$p_N B e L (1 - \sigma \lambda) = \frac{\alpha}{(1 - \alpha)} \left[(1 - s \pi) p_T Y_T + \dot{D}^W - s i D^W - (1 - s) i M^F \right] \quad (\text{A4})$$

Dividing both sides by $p_N e K$:

$$\frac{B L (1 - \sigma \lambda)}{K} = \frac{\alpha}{(1 - \alpha)} \left[(1 - s \pi) \frac{p_T}{p_N e} \sigma + \frac{p_T}{p_N e} \frac{\dot{D}^W}{p_T K} - \frac{p_T}{p_N e} \frac{[s D^W + (1 - s) M^F] i}{p_T K} \right] \quad (\text{A5})$$

Using equations 6 and 7, $\frac{p_T}{p_N e}$ can be written as: $\frac{p_T}{p_N e} = \frac{B}{A(1-\pi)} \frac{w_T}{w_N}$. Inserting this expression gives:

$$\frac{B L (1 - \sigma \lambda)}{K} = \frac{\alpha}{(1 - \alpha)} \left[(1 - s \pi) \frac{B}{A(1 - \pi)} \frac{w_T}{w_N} \sigma + \frac{B}{A(1 - \pi)} \frac{w_T}{w_N} \frac{\dot{D}^W}{p_T K} - \frac{B}{A(1 - \pi)} \frac{w_T}{w_N} \frac{[s D^W + (1 - s) M^F] i}{p_T K} \right] \quad (\text{A6})$$

As previously states in section 4.5, with a fixed mark-up, a successful inflation targeting requires a constant wage inflation. This in turn requires that 1) the actual wage in the T-sector is equal to the target wage, and 2) there is a fixed relationship between the wages in the two sectors. These two conditions can be summarized as:

$$w_T = w^O = \mu w_N \quad (\text{A7})$$

Therefore, under the assumption of a successful inflation targeting, $\frac{p_T}{p_N e}$ is fixed and given by $\frac{p_T}{p_N e} = \frac{B \mu}{A(1-\pi)}$. Using $\lambda = \frac{K}{A L}$, we have:

$$\frac{B (1 - \sigma \lambda)}{A \lambda} = \frac{\alpha}{(1 - \alpha)} \left[(1 - s \pi) \frac{B \mu}{A(1 - \pi)} \sigma + \frac{B \mu}{A(1 - \pi)} \frac{\dot{D}^W}{p_T K} - \frac{B \mu}{A(1 - \pi)} \frac{[s D^W + (1 - s) M^F] i}{p_T K} \right] \quad (\text{A8})$$

Re-arranging the terms yields:

$$\sigma = \frac{1}{\left[\frac{B}{A} + \frac{\alpha}{(1-\alpha)}(1-s\pi)\frac{B\mu}{A(1-\pi)} \right]} \left\{ \frac{B}{A\lambda} - \frac{\alpha}{(1-\alpha)} \frac{B\mu}{A(1-\pi)} \frac{\dot{D}^W}{p_T K} + \frac{\alpha}{(1-\alpha)} \frac{B\mu}{A(1-\pi)} \frac{[sD^W + (1-s)M^F]i}{p_T K} \right\} \quad (\text{A9})$$

Appendix B: Tradable sector equilibrium

$$p_T Y_T = p_T C_T + p_T I_T + p_T X_T = (1-\psi)(1-\alpha)pC + p_T \beta I + p_T \phi(\eta) \quad (\text{B1})$$

Inserting pC from equation 14:

$$p_T Y_T = (1-\psi)(1-\alpha) \left[p_N Y_N + (1-s\pi)p_T Y_T + \dot{D}^W - siD^W - (1-s)iM^F \right] + p_T \beta I + p_T \phi \quad (\text{B2})$$

Dividing both sides of this equation with $p_T K$:

$$\sigma = (1-\psi)(1-\alpha) \left[\frac{p_N Y_N}{p_T K} + (1-s\pi)\sigma + \frac{\dot{D}^W}{p_T K} - \frac{[sD^W + (1-s)M^F]i}{p_T K} \right] + \beta(a + a_1\sigma) + \frac{\phi}{K} \quad (\text{B3})$$

From equation 15, we have:

$$p_N Y_N = p_N C_N = \alpha pC = \alpha \left[p_N Y_N + (1-s\pi)p_T Y_T + \dot{D}^W - siD^W - (1-s)iM^F \right] \quad (\text{B4})$$

$$p_N Y_N = \frac{\alpha}{1-\alpha} \left[(1-s\pi)p_T Y_T + \dot{D}^W - siD^W - (1-s)iM^F \right] \quad (\text{B5})$$

Inserting this equation into the expression for σ :

$$\begin{aligned} \sigma &= (1-\psi)(1-\alpha) \left\{ \frac{\alpha}{1-\alpha} \left[(1-s\pi)\sigma + \frac{\dot{D}^W}{p_T K} - \frac{[sD^W + (1-s)M^F]i}{p_T K} \right] + \right. \\ &\quad \left. (1-s\pi)\sigma + \frac{\dot{D}^W}{p_T K} - \frac{[sD^W + (1-s)M^F]i}{p_T K} + \beta(a + a_1\sigma) + \frac{\phi}{K} \right\} \quad (\text{B6}) \end{aligned}$$

Rearranging the terms yields:

$$\sigma = \frac{1}{1 - (1-\psi)(1-s\pi) - 1} \left\{ (1-\psi) \left(\frac{\dot{D}^W}{p_T K} - \frac{[sD^W + (1-s)M^F]i}{p_T K} \right) + \beta a + \frac{\phi(\eta)}{K} \right\} \quad (\text{B7})$$

Appendix C: Comparative Statics

To find the partial derivative of σ with respect to \dot{D}^W , let's first take the total derivatives of equation 27b and 29b. These are given by:

$$G_1 d_\sigma + G_2 d_i + G_3 d_{\dot{D}W} = 0 \quad (C1)$$

$$H_1 d_\sigma + H_2 d_i + H_3 d_{\dot{D}W} = 0 \quad (C2)$$

These total derivatives can be written in matrix form as:

$$\begin{bmatrix} G_1 & G_2 \\ H_1 & H_2 \end{bmatrix} \begin{bmatrix} d_\sigma \\ d_i \end{bmatrix} = \begin{bmatrix} -G_3 \\ -H_3 \end{bmatrix} d_{\dot{D}W}, \quad \begin{vmatrix} G_1 & G_2 \\ H_1 & H_2 \end{vmatrix} \neq 0 \quad (C3)$$

Using Implicit Function Theorem, we have:

$$\begin{bmatrix} G_1 & G_2 \\ H_1 & H_2 \end{bmatrix} \begin{bmatrix} d_\sigma d_{\dot{D}W} \\ d_i d_{\dot{D}W} \end{bmatrix} = \begin{bmatrix} -G_3 \\ -H_3 \end{bmatrix} \quad (C4)$$

Using Cramer's rule, $\frac{d_\sigma}{d_{\dot{D}W}}$ is given by:

$$\frac{d_\sigma}{d_{\dot{D}W}} = \frac{\begin{vmatrix} -G_3 & G_2 \\ -H_3 & H_2 \end{vmatrix}}{\begin{vmatrix} G_1 & G_2 \\ H_1 & H_2 \end{vmatrix}} = \frac{\frac{1}{-G_3 H_2 + H_3 G_2}}{\frac{1}{G_1 H_2 - H_1 G_2}} \quad (C5)$$

To establish the sign of $\frac{d_\sigma}{d_{\dot{D}W}}$, we need to establish whether $-G_3 H_2 + H_3 G_2$ is less than, equal to, or greater than 0. Note that the partials are given by:

$$G_2 = -\frac{1}{\Theta} \frac{\alpha}{1-\alpha} \frac{B\mu}{A(1-\pi)} \frac{[sD^W + (1-s)M^F]}{p_T K} \quad (C6)$$

$$G_3 = \frac{1}{\Theta} \frac{\alpha}{1-\alpha} \frac{B\mu}{A(1-\pi)} \frac{1}{p_T K} \quad (C7)$$

$$H_2 = \frac{1-\psi}{\Lambda} \frac{[sD^W + (1-s)M^F]}{p_T K} - \frac{\phi'(\eta)}{\Lambda K} \quad (C8)$$

$$H_3 = \frac{-(1-\psi)}{TK} \quad (C9)$$

Inserting these expressions into $-G_3 H_2 + H_3 G_2$ gives:

$$-\frac{1}{\Theta} \frac{\alpha}{1-\alpha} \frac{B\mu}{A(1-\pi)} \frac{1}{p_T K} \left[\frac{1-\psi}{\Lambda} \frac{[sD^W + (1-s)M^F]}{p_T K} - \frac{\phi'(\eta)}{\Lambda K} \right] + \frac{(1-\psi)}{TK} \frac{1}{\Theta} \frac{\alpha}{1-\alpha} \frac{B\mu}{A(1-\pi)} \frac{[sD^W + (1-s)M^F]}{p_T K} \quad (C10)$$

As long as $\phi'(\eta) > 0$, we have:

$$\frac{(1-\psi)}{TK} \frac{1}{\Theta} \frac{\alpha}{1-\alpha} \frac{B\mu}{A(1-\pi)} \frac{[sD^W + (1-s)M^F]}{p_T K} < \frac{1}{\Theta} \frac{\alpha}{1-\alpha} \frac{B\mu}{A(1-\pi)} \frac{1}{p_T K} \left[\frac{1-\psi}{\Lambda} \frac{[sD^W + (1-s)M^F]}{p_T K} - \frac{\phi'(\eta)}{\Lambda K} \right] \quad (C11)$$

In other words, as long as the interest elasticity of the real exchange rate is greater than zero, and the exchange rate elasticity of exports is negative (i.e., a real exchange rate appreciates causes a decline in exports) (i.e., $\phi'(\eta) > 0$), we can establish that $-G_3 H_2 + H_3 G_2 < 0$. Therefore, we have:

$$\frac{d\sigma}{dD^W} < 0 \quad (C12)$$

Appendix D: Stock-Flow Consistency

In the model, we assumed that total loans, divided into loans given to workers and capitalists, are equal to total deposits, which are held by foreigners and capitalists. For the model to be stock-flow consistent, we need to ensure that this balance sheet condition is maintained over time, i.e.,

$$\dot{M}^F + \dot{M}^C = \dot{D}^C + \dot{D}^W \quad (D1)$$

We can use the IS equation, capitalists'/firms' finance constraint, and equation defining \dot{M}^F , all reproduced below, to check whether equation D1 holds.

The IS equation:

$$p_N Y_N + p_T Y_T = p_N C_N + p_T C_T + \beta p_T I + p_T X \quad (D2)$$

Capitalists'/firms' finance constraint:

$$p_K I = s(\pi p_T Y_T - i D^C + i M^C) + \dot{D}^C - \dot{M}^C \quad (D3)$$

Change in foreign deposits:

$$\dot{M}^F = i M^F - N X \quad (D4)$$

From equation D4 and 24, $p_T X$ is given by:

$$p_T X = \dot{M}^F - i M^F - n p^* C_{IM} - (1-\beta) n p^* I \quad (D5)$$

From equation 14, we have

$$p_N C_N + p_T C_T = p_N Y_N + (1-\pi) p_T Y_T + \dot{D}^W - i D^W + (1-s)(\pi p_T Y_T - i D^C + i M^C) - n p^* C_{IM} \quad (D6)$$

From equation 21 and equation A3, $\beta p_T I$ is given by:

$$\beta p_T I = s(\pi p_T Y_T - i D^C + i M^C) + \dot{D}^C - \dot{M}^C - (1-\beta) n p^* I \quad (D7)$$

Inserting equation D4, D5, and D6 into the IS equation, we have:

$$p_N Y_N + p_T Y_T = p_N Y_N + (1 - \pi)p_T Y_T + \dot{D}^W - iD^W + (1 - s)(\pi p_T Y_T - iD^C + iM^C) - np^* C_{IM} + s(\pi p_T Y_T - iD^C + iM^C) + \dot{D}^C - \dot{M}^C - (1 - \beta)np^* I + \dot{M}^F - iM^F - np^* C_{IM} - (1 - \beta)np^* I \quad (D8)$$

Using the assumption that $D^W + D^C = M^F + M^C$ and simplifying equation D8 yields:

$$\dot{M}^F + \dot{M}^C = \dot{D}^C + \dot{D}^W \quad (D9)$$

Hence the model is stock-flow consistent.

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