TURKEY COUNTRY ECONOMIC MEMORANDUM

A LOOK AT CERTAIN ASPECTS OF INVESTMENT

WORLD BANK GROUP
Turkey Country Economic Memorandum (CEM)

A Look at Certain Aspects of Investment

September 2016
## CURRENCY EQUIVALENTS

(Exchange Rate as of September 30, 2016)

<table>
<thead>
<tr>
<th>Currency Unit</th>
<th>Turkish Lira</th>
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<tr>
<td>USD 1.00</td>
<td>3.0004 TL</td>
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Weights and Measures: Metric System

### ABBREVIATIONS AND ACRONYMS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AISS</td>
<td>Annual Industry and Service Statistics</td>
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<tr>
<td>CBRT</td>
<td>Central Bank of Turkey</td>
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<tr>
<td>CEM</td>
<td>Country Economic Memorandum</td>
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<tr>
<td>CEPII</td>
<td>Research and Expertise on the World Economy</td>
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<td>CoHE</td>
<td>Council of Higher Education</td>
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<td>CPI</td>
<td>Consumer Price Index</td>
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<tr>
<td>EBRD</td>
<td>European Bank for Reconstruction and Development</td>
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<td>ECA</td>
<td>Europe and Central Asia</td>
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<tr>
<td>ENQA</td>
<td>European Association for Quality Assurance in Higher Education</td>
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<td>ETF</td>
<td>European Training Fund</td>
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<td>EU</td>
<td>European Union</td>
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<tr>
<td>FDI</td>
<td>Foreign Direct Investment</td>
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<td>FX</td>
<td>Foreign Exchange</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>GLS</td>
<td>Generalized Least Squares</td>
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<tr>
<td>GYODER</td>
<td>The Association of Real Estate and Real Estate Investment Companies</td>
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<td>HAI</td>
<td>Housing Affordability Index</td>
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<td>HBS</td>
<td>Household Budget Survey</td>
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<td>IMF</td>
<td>International Monetary Fund</td>
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<td>IQ</td>
<td>Intelligence Quotient</td>
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<td>ISCED</td>
<td>International Standard Classification of Education</td>
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<td>LITS</td>
<td>Life in Transition Survey</td>
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<td>LLL</td>
<td>Lifelong Learning</td>
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<td>NHI</td>
<td>New Home Price Index</td>
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EXECUTIVE SUMMARY

1. Following comprehensive economic reforms in 2001, Turkey’s high economic growth rates and currency appreciation led to a near-tripling of average per-capita incomes to about USD 10,000 in the late 2000s. The growth spurt was dented by the global financial crisis in 2008-09, but the economy rebounded quickly until 2011. However, since then economic growth has decelerated and the pace of reform has slowed amid an increasingly difficult international environment. The growth model itself is challenged, given its reliance on household consumption: domestic saving declined by 10 percentage points of gross domestic product (GDP) between 2002 and 2012, as housing wealth increased and consumer credit availability surged. With the reduction in domestic saving, banks borrowed abroad to on-lend to Turkish corporates in foreign currency, thus maintaining a noticeable current account deficit. While the falling oil prices since mid-2014 have significantly benefited Turkey, export dynamism slowed simultaneously in parallel with the recent slowdown in global trade growth and the current account deficit is still a reason for concern.

Is Turkey Facing the ‘Middle Income Trap’?

2. Studies of economic development have noted that some countries entered a period of stagnation at upper middle income level (around USD 10,000 per capita income), just where Turkey’s per capita income is now. Middle-income countries become ‘squeezed between the low-wage, poor-country competitors that dominate in mature industries and the rich-country innovators that dominate in industries undergoing rapid technological change’, a phenomenon called the ‘middle-income trap’. The literature has identified the conditions and challenges for countries on the road to high-income status, which we define as more than USD 12,800 per capita income, the International Bank for Reconstruction and Development (IBRD) threshold. A recent World Bank research volume about Turkey’s economic development, Turkey’s Transitions: Integration, Inclusion, Institutions, lists the requirements to overcome the ‘middle-income trap’ and continue advancing to high income, as follows:

- Ongoing structural change (moving labor out of low-productivity and into high-productivity occupations),
- Macro stability and avoidance of crises,
- Openness of the economy to trade and capital flows,
- A ‘young’ demography,
- A high innovation potential, and
- High-quality government regulation and adherence to the rule of law.

How does Turkey perform against this blueprint?

3. Turkey has good fundamentals to continue its progress to high income. It still has 20 percent of its labor force engaged in agriculture, thus further scope for productivity growth to be driven by reallocation of labor within sectors. Turkey has a falling ratio of economically active to

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inactive people for another ten years or so, and a track record of macroeconomic stability since 2002, important trade and capital flow relationships, in particular through close ties with the European Union (EU).

4. In contrast, it faces important challenges on the road to high income related to innovation, and institutions regulating the economy and assuring adherence to the rule of law.

5. This Country Economic Memorandum (CEM) focuses on the challenges Turkey faces in accumulating productive assets that would enable the economy to grow and incomes to converge with high-income countries. We investigate the accumulation of physical, human, and institutional capital in line with the familiar Solow growth model. After a general overview, we analyze in detail some aspects of these three types of assets: housing, tertiary education, and the importance of institutions for attracting foreign direct investment (FDI). The picture we develop is as follows.

- **Physical capital:** Turkey has done well with building infrastructure, but the capital stock remains low for its level of income. Private investment has lacked dynamism in recent years amid domestic and international difficulties. It has relied strongly on a bank-centric financing model, which substituted low domestic saving with borrowing from abroad. Corporate leverage has greatly expanded, in particular in the years after the global financial crisis, while lending headroom has been eroded in an otherwise strong banking system. Therefore, it will be difficult to reinvigorate investment growth with the current financing model.

- **Human capital:** Labor force participation in particular of women is the lowest in the Organization for Economic Co-operation and Development (OECD), and Turkish students rank among the lowest (just above Chile and Mexico) compared with the rest of the OECD countries in the Program for International Student Assessment (PISA). However, both have been improving rapidly. In fact, the catch-up in PISA scores was the fastest in the OECD. There are indications of skills mismatches, and there are also questions over the quality of education, in particular in light of rising unemployment among university graduates and relatively weak performance in research and innovation.

- **Institutional capital:** The quality of Turkey’s institutions (regulatory institutions to ensure market functioning and the rule of law) falls short of countries that have successfully transitioned to high income, and the gap is widening. Turkey ranks well below 50 on common indicators measuring the quality of economic institutions for more than 100 countries worldwide, and the distance to the top has been widening. Turkey has lost its position in important indicators in the last two years, i.e. Turkey’s institutional quality is declining relative to other countries.

6. This report shows that Turkey’s capital stock is relatively low, and economic growth will largely depend on its ability to improve factor accumulation and boost productivity through structural reforms. ‘Business as usual’ will see Turkey’s economic growth limited to about 3.5 percent per year, which will not be enough to see meaningful progress in living standards. Potential growth with reasonable ‘business-as-usual’ assumptions about investment in physical and human capital and productivity growth—i.e. in the absence of solid implementation of the pending structural reform agenda—will be around 3.5 percent. Decisive action to help the
effectiveness of infrastructure, boost female labor force participation, improve the quality of education, and improve the quality of Turkey’s institutions could support significantly higher growth.

In-depth analyses

7. The report provides detailed analyses of specific aspects of the three types of assets discussed above: the housing aspects of infrastructure investment, tertiary education for upgrading human capital, and the quality of institutions as determinants of FDI. The three topical chapters cover the following issues.

- **The Housing Sector.** Housing is an important aspect of Turkey’s physical capital accumulation, by accommodating rural migrants closer to higher-productivity jobs, and through backwards and forwards linkages of construction with other sectors. Housing construction kept pace with the fast process of urbanization reaching a peak in the 1990s. Turkey’s cities successfully integrated migrants and allowed them to raise economy-wide productivity and support growth. There are important inter-city, regional, and market segment differences, and data gaps make it difficult to arrive at a detailed picture about developments in these market segments. On average, housing prices have risen significantly in the 2000s, but the incomes of most Turkish households have kept pace with rising housing costs and rental expenditures are below 30 percent of households’ overall expenditures on average. However, the share of housing costs in overall household expenditures has risen by about 10 percentage points for poorer households, indicating demand pressures in the segment of low-income housing.

  - Turkey provides a positive example of a successful urbanization experience despite the fact that the speed with which nearly three-quarters of Turkey’s people moved to the cities was significantly higher than in most other developing countries. Yet, apart from temporary, low-quality squatter housing estates emerging mainly in the 1990s, Turkey has avoided the creation of the kind of sprawling slums that are a familiar sight in cities in many other middle income countries. However, the success now threatens to be overshadowed by urban sprawl and congestion. This increases the environmental footprint of cities, and diminishes the benefits of agglomeration.

  - The accessibility of mortgage finance for prospective house buyers is relatively low, while developers shift construction and completion risks to households by selling units well before completion against high down payments. On the demand side, mortgages are accessible only to relatively wealthy buyers, with their high interest rates and average maturity of less than 10 years. Most house buyers therefore use their own funds rather than mortgages. This is another aspect of the bank-centric financing model mentioned above: securitization, institutional investors, and non-bank capital markets are underdeveloped.

- **Tertiary Education.** It is instrumental in equipping workers with the knowledge and skills needed for upgrading production and exports. Enrolment in tertiary education and

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4 World Bank, 2015.
graduation rates rose significantly in recent years, albeit from low levels. However, there are concerns about the quality of this great increase in the quantity of education, with enterprise surveys indicating dissatisfaction with available skill levels by employers, low research output of universities, and weak ties between universities and industry. In fact, Turkey gets relatively little value for the money its government invests in higher education.

- Important challenges in the governance of the educational system and financing of its universities are likely culprits for the shortcomings. Governance is concentrated in the hands of the Council of Higher Education (CoHE), which exerts control over all aspects of administration and also prescribes detailed budget line items of state universities. State universities therefore lack the freedom and incentives to find avenues to improve performance. Turkey has also not yet implemented all the steps agreed with European partners in the Bologna process, which is aimed at the convergence of higher education in Europe. In particular, Turkey falls short in quality assurance mechanisms. Finally, lifelong learning (LLL) has become the preferred model in high-income countries, which equips their workers with the ability to adapt to fast changing production processes and technologies. The development of an LLL model still has some way to go in Turkey.

- The Quality of Institutions. It is among the most important parameters foreign investors look at before investing in a country, apart from market growth and perceived stability of macroeconomic parameters. FDI is desirable not only because it is a relatively stable source of financing, but also because it helps diffuse new skills and technologies in the receiving country. Our analysis of firm-level and cross country data show that Turkish firms that receive foreign investment improve their productivity three-to-four years after they receive the investment, and likewise firms closely connected to them benefit from spill-overs. The regressions shine the spotlight on the positive effects of improving institutional quality by detecting the positive effects of the process of gaining membership in the EU. This helps explain why Turkey received much more FDI in the years around 2005, when EU membership negotiations started with some dynamism, which then fizzled out a few years later.

- Looking at the interplay of education, migration, and FDI, it is clear that incoming FDI in Turkey was predominantly aiming to take advantage of low-skilled, low-wage opportunities in recent years. However, the data also indicates that foreign investors are reacting positively to the large increase in enrolment in tertiary education, and are investing in Turkey to take advantage of future skills. Outbound investment, on the other hand, is clearly skill seeking, i.e. Turkish firms invest abroad to take advantage of higher skill levels in high-income countries. The results indicate that improving human capital would lead to higher investment into high-skill, high-value added production in Turkey, and less skill-seeking outbound investment by Turkish firms.
What can be done?

8. **The common theme in this CEM is the central role of governance and institutions in Turkey’s development process.** High economic growth rates require that domestic and foreign investors take risks, and the smaller the perceived risks, the higher the investment. Structural reforms that improve the business climate, assure stability and promote law and order, not least the reforms related to the EU convergence process, are conducive to higher investment rates, in particular to attracting more foreign investment. They are also crucial ingredients for the development of broader financial markets, which will be needed to service the financing needs of highly leveraged firms, and provide affordable mortgages to the underserved lower-income groups. In the same vein, the management of the urbanization process needs to heed the warnings of rising commuting times and an increasing environmental footprint to avoid losing the agglomeration benefits that have propelled Turkey’s growth in recent decades. The governance of educational institutions likewise emerged as a central challenge in improving human capital in Turkey, and with it the ability of Turkish businesses to adapt new technologies and benefit from innovations. Better human capital would not only attract more FDI into Turkey, but also reduce capital outflows searching for skills elsewhere. The central messages in this CEM are the following.

- **Financial sector development:** A pick-up in investment growth is hampered by increasing leverage in corporate balance sheets, and diminishing lending head room of banks. Development of capital markets is therefore crucial to provide stable sources of long-term financing, which now shows high dependency on external financing in a bank-centric model. Developing deeper and longer-term bond markets – notably local currency bonds – as well as equity markets would help diversify and provide more stable financing for productive real-sector activity, and reduce any excessive dependency on banking intermediation and transformation risks. Challenges to expand the capital markets further in Turkey include low levels of savings, investors’ preferences for short-term investments, the relatively small size of the institutional investors and their short term maturity profile, limited diversity of corporate debt instruments, low cost-effectiveness of funding through domestic capital markets vis-a-vis financing through banks or the international capital markets, and low liquidity in the secondary markets of the corporate bonds.

- **A second-generation urban development agenda:** the high population growth in the periphery of Turkish cities highlights the need to focus on planning, connecting, and financing cities, in particular in the 14 metropolitan municipalities newly created in March 2014, as we outlined in the recent *Rise of the Anatolian Tigers: Urbanization Review.*\(^5\) The main messages are worth repeating here: Planners will have to look at medium- to long-term population projections and devise environmentally, economically, and socially sustainable patterns for future development. This would help in delivering larger-scale and more complex infrastructure systems, and coordinate land use planning with infrastructure delivery across the metropolitan footprint. Property and land valuation and taxation play particularly important roles in efficient city development.

- **Monitoring of house price developments:** house prices have increased significantly, with major urbanizations leading the way, and house price growth has outrun the increase in house rents. Compared to other OECD countries, the ratio of prices to rents in Turkey

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\(^5\) World Bank 2015.
indicates that purchase prices are now overvalued. However, it is difficult to generalize, because real estate developments are always highly location and market segment specific. There are important data gaps, which make it difficult to analyze developments in specific locations. For example, housing statistics are not available for sub-regions. The new housing price index published by the Central Bank of Turkey (CBRT) is an important innovation, but the short time the series available reduces its usefulness for now.

- **The sharply increasing cost of housing on low-income households:** while housing costs are a relatively stable share of expenditure for average households, the sharp increase for those at the bottom of the distribution gives rise to concern. The mortgage industry is relatively underdeveloped and largely inaccessible for low-income households. Mortgages are relatively expensive with short tenors, and low-income households often are not able to provide the required 25 percent down payment. The government has recently decreased the required down payment from 25 to 20 percent and introduced housing accounts, in which government matches up to 20 percent of the savings in the accounts, but broader financial development is likely to help more, if done in a way that safeguards stability (see above).\(^6\)

- **Governance of educational institutions:** Better incentives would allow tertiary education institutions to improve their alignment with the requirements of an increasingly competitive environment. Such incentives would be provided by performance-based financing. However, the CoHE’s ubiquitous responsibilities currently stand in the way of performance based financing. It requires a clear division of responsibilities between the government and the universities. The combination of the two sides in the CoHE would generate a conflict of interest in any performance based financing process. Also, Turkey committed to the introduction of an independent quality assurance mechanism in the Bologna process, and this still has to be implemented.

- **Stronger institutions to attract more FDI:** Cross-country evidence shows the importance of government stability and law and order to attract FDI. The perceived deterioration in law and order since 2011 would therefore have to be corrected to help enhance FDI attraction. Similarly, while Turkey has done well with prudent macroeconomic management, including through the introduction of strong macro-prudential measures after the 2008-09 crisis to mitigate exchange rate volatility, the pronounced depreciation observed since late 2013 may have deterred FDI (in the face of declining value of foreign investment over time due to depreciation). Policies aimed at increasing exchange rate stability, by targeting inflation or other means, could potentially benefit FDI inflows. The data analysis also shows the importance of the agenda to improve tertiary education to attract more resource-seeking FDI in Turkey, and reducing similar outbound FDI. In addition, facilitating skilled labor immigration into Turkey would help attract FDI; in this sense, the enactment of the International Labor Force Law in August 2016 and the creation of the International Labor Policy Advisory Board, in charge of determining and applying the main policies on international labor force and foreign employment demands, are welcome steps.

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\(^6\) Households need to make regular payments to the housing accounts for at least three years to be eligible for the government matching. The maximum government contributions to housing accounts are TL15000.
1. **INTRODUCTION AND OVERVIEW**

9. **High economic growth rates and currency appreciation have resulted in a near-tripling of per capita GDP over the past decade, allowing Turkey to reach upper middle-income status.** The foundations for this growth spurt were laid with the economic opening of the 1980s, the European economic integration process starting with the 1995 customs union, and the strengthening of economic and financial institutions after the 2001 political and financial crisis. It was propelled forward by structural change, which saw the share of agriculture in overall employment decline, alongside a rapid urbanization of the population. Since the swift rebound from the global financial and economic crisis in 2008-09, economic growth in Turkey has decelerated amid an increasingly difficult international environment.7

10. **This CEM is a continuation of the World Bank’s series of analyses of macroeconomic developments and growth drivers over recent years.** Most recently, the series looked at the determinants of national savings, *Sustaining High Growth: The role of Domestic Savings*8 documents the decline in private savings, which was only partly offset by an increase in public savings. It carefully examines microeconomic determinants of household savings. It highlights a decline in precautionary savings in line with the stabilization of the economy, in particular a decline in inflation, and an increase in the use of consumer credit. It also detected considerable sums of household savings outside the banking system in the form of gold and real estate. Rising incomes and education levels should increase savings over time. It develops recommendations for increasing savings along three channels: growth enhancing policies to enhance incomes, promoting savings through the private pension system, develop the financial system to attract more savings into the banking system.

11. **This CEM highlights challenges Turkey faces in sustaining investment in some assets in order to continue moving into high income.** It is therefore a natural follow-up to the study of savings published in 2012. Its focus was discussed with counterparts in the government of Turkey and academia. Government counterparts specifically requested an analysis of housing, because of widely discussed concerns of a developing housing and construction bubble. In light of this specific request, the CEM looks in detail into specific aspects of investment, while keeping a more general discussion short in the second chapter. This resulted in a format with a *chapeau* chapter (Chapter 2) and three topical chapters with relatively few interconnections.

12. **The analysis for the CEM is motivated by the discussions in the economics literature on whether or not countries face a particular set of challenges when their per capita income reaches upper middle income levels.** Several countries have remained at this level for years after growth plateaued and structural change came to a halt. This stagnation has been called the ‘middle-

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7 In the context of the Tenth Development Plan (2014-2018), the action plans of 25 priority transformation programs covering several reform/policy areas were put into implementation in February, 2015. In the course of 2016, the reform program has revived and some progress has been achieved in private sector development (introduction of secured transaction system for SMEs), enhancing labor market flexibility, incentivizing R&D and innovation (enactment of Industrial Intellectual Property Law) and promoting savings (introduction of auto enrollment in Private Pension Saving and Investment System). Ongoing efforts towards increasing investments and growth will be more effective by robust and timely implementation of the reform agenda.

8 World Bank (2012).
income trap’. To continue growing, economies need to respond to shifting demand and converge to the frontier in technology and productivity. The challenge is to shift growth drivers from structural change (the move of labor out of agriculture into manufacturing and services) to productivity improvement, technology absorption, and innovation in order for the product mix to ‘move up the value chain’ and contain higher value added goods and services. In the absence of such a shift in growth strategy, middle-income countries experience growing competitiveness problems: due to rising unit labor costs they become increasingly unable to compete with lower-cost countries, while a lack of productivity improvement and innovation makes it difficult to break into more sophisticated markets that are typically occupied by higher-income countries.

13. **Studies of the ‘middle-income trap’ identify the reasons why countries got ‘stuck’ and how others got ‘unstuck’.** They focus on the policies and structural factors that are needed to ensure consistent growth spells and avoid crises, which can drop countries back down a few rungs on the ladder to high income. The elements for converging to high income include the potential to have ongoing structural change (moving labor out of low-productivity and into high-productivity occupations), a ‘young’ demography, macro stability and avoidance of crises, and openness of the economy to trade and capital flows. From this literature, we can identify what will propel Turkey forward, and what factors require attention in order to prevent them from becoming parts of the ‘trap’. On the positive side, Turkey will benefit from the following:

   (i) Structural characteristics: a remaining large agricultural labor force, which can reallocate to higher-productivity jobs in industry and services.

   (ii) Demographic factors: Turkey will be enjoying falling dependency rates for some years and labor force participation is trending up, with a lot of room still to converge with other OECD countries.

   (iii) Macroeconomic stability: following the 2001 crisis, Turkey’s economy has grown steadily with low inflation, a sound banking sector, and sound public finances, although the current account deficit and its financing give rise to concerns.

   (iv) The degree of openness of the economy to trade and FDI: Turkey’s economy is open, and trade growth has been an important driver of fast growth during the 2000s, in particular through ever-closer ties with EU.

14. **In contrast, challenges on the road to high income are posed by different aspects of Turkey’s assets.**

   (i) While Turkey is an example of a successful fast urbanization process, urban sprawl and congestion now threaten the benefits from agglomeration that greatly helped growth in previous decades.

   (ii) The technology and innovation potential is limited by a relatively low skill base and low investment in Research and Development (R&D).

   (iii) The quality of government regulation, the rule of law, and the business climate are below those in high-income countries.

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11 See also the discussion in World Bank (2014).
Thus, the requirements to overcome the ‘middle-income trap’ translate into challenges to the accumulation of Turkey’s physical, human, and institutional assets. This report analyzes investment in these types of assets. The report continues as follows: The next chapter gives an overview of aggregate sectoral, private, public, and foreign investment in Turkey. It then discusses the accumulation of physical, human, and institutional assets in recent years and compares stocks with other countries. It highlights the risks of a seminal slow-down because of the lack of investable funds in the highly bank-centric financial system, and a strong reliance on foreign savings. Chapter 3 analyses Turkey’s housing sector, looking at the provision of housing, juxtaposing supply and demand and financing of both developers and buyers. It discusses the second-generation urban development challenges, which require attention to where and what kind of housing is built going forward, and come back to the weaknesses of the financial system discussed in Chapter 2: mortgage availability and affordability is constrained by a low level of development of Turkey’s bond and securitization market. Chapter 4 discusses developments and challenges in the tertiary education sector highlighting the relations between the governance and financing of education institutions and their performance and quality. Chapter 5 provides evidence for the impacts and determinants of FDI, and its two-way relationship with migration. It highlights the importance of institutions to make Turkey an attractive place to invest in for foreign and domestic investors. In addition, it supports the discussions in Chapter 2 and 4 about the need to upgrade education, because of the strong role played by the level of skills in the labor force to attract FDI likely to support upgrading of technology, and keeping investment in Turkey, which would otherwise seek skills abroad.
2. Turkey’s Capital Accumulation

16. This chapter explores Turkey’s investment in recent decades and develops an outlook for the future, with particular emphasis on the accumulation of some types of physical, human, and institutional assets. The first section describes the recent development of the Turkish economy and highlights the slowdown in growth and increasing reliance on foreign exchange inflows. The second section looks more specifically at Turkey’s record in investment, which has been strong but below that of developing East Asia. While public investment has declined in line with the major privatization drive in the 2000s, it has supported an important build-up in infrastructure and has crowded in private investment. However, investment has resulted in a strong expansion of corporate debt, and leverage ratios are now higher than in comparable countries. With high leverage in the corporate sector, and at the same time diminishing lending head room in the banking sector, the lack-luster performance of investment of the last few years is likely to continue.

17. After the macro and investment overviews, the following three sections describe the accumulation of physical, human, and institutional capital. They point out that the capital stock is still relatively low, both physical and human capital. However, return on capital is high when measured using the growth accounting framework, although it has to be acknowledged that it has its limitations. The human capital stock is particularly low when measured by educational data and learning achievement tests. Institutional quality improved significantly in the 2000s with the creation of independent regulatory institutions, and various democratization reforms. However, international comparison shows that Turkey’s institutions are ‘middle income’, i.e. there is an important distance to cover to reach the frontier of high-income economies. Unfortunately, important institutional quality indexes show declining quality in recent years. The final section looks at the determinants of economic growth over the past decades, in particular the contribution of assets and total factor productivity to growth. It distinguishes different political periods, which show the link between political stability and total factor productivity growth. The chapter then explores possible growth scenarios highlighting the importance of both factor accumulation (in particular female labor force participation and physical and human capital investment) as well as factor productivity, which is a proxy for knowledge and technology.

Recent Economic Developments

18. Turkey’s GDP growth has slowed since 2012 because of structural and cyclical factors and a challenging external and internal environment. Domestically, a long-electoral period, government reshuffle, terrorist attacks, and a failed coup attempt in July 2016 have contributed to increased uncertainty. Geopolitical factors, in particular the Syrian crisis, also weighed heavily on the economic and political stability of the region. Turkey’s loss of ground is reflected in several international institutional indicators, such as the World Economic Forum Global Competitiveness Index, where Turkey’s rank declined to 55 in 2017 from 43 in 2013, driven partly by the Institutions pillar of the Index, where the country’s standing declined from 64 to 74. Turkey’s assets have also been heavily re-priced, stretching the balance sheets of non-financial corporates, which hold large open foreign exchange (FX) positions. Against this backdrop, private investment, one of the main drivers of growth in the previous decade, has collapsed, its contribution averaging slightly negative. Moreover, productivity growth has stagnated in parallel with slowing structural transformation and technology diffusion. These developments have curtailed GDP growth to the 2 percent–4 percent range in 2012-16.
19. **The Turkish economy faces considerable risks stemming from a declining saving rate from the early 2000s.** Gross national saving declined in the 2000s to around 15.8 percent of GDP in 2014, from around 21.5 percent in 2001, making investment increasingly dependent on foreign saving and widening the current account deficit. Part of the reason for the decline in saving was the increase in households’ wealth invested in housing due to a house price boom. Surveys show the strong inclination of Turkish households to invest in housing as a store of wealth. In addition, Turkish households took to the introduction of credit cards much more than comparable countries, and credit card use is now the highest in Europe and Central Asia (ECA). It is also noteworthy that Turkey’s energy deficit increased from around 3 percent of GDP in 2003 to 7 percent of GDP in 2014, due to the increase in energy demand and energy prices, which contributed to the decline in the saving rate. The energy deficit has since declined thanks to the sharp decline in oil prices, but a simultaneous decline in exports, and in particular tourism earnings, compensated for much of the decline in the energy deficit leaving the current account deficit largely unchanged.

20. **Turkey’s sizeable financing needs create vulnerabilities.** With the expected tightening in global liquidity in the medium-term, Turkey’s large external financing requirement poses downside risks to our baseline scenario. The current account deficit is forecasted at 4.7 percent of GDP, and external debt equivalent to 24 percent of GDP is coming due in the next 12 months. In September, Moody's downgraded Turkey's credit rating to Ba1 (one notch below investment grade) from Baa3, citing the large external financing requirement as the main source of fragility and the reason for the downgrade. The downgrade may affect financing costs. The renewed financing shortfalls would put pressure on the Lira.

21. **Corporates have sizeable FX exposure posing risks to private investment and the banking sector.** The FX leverage has increased significantly in the past few years, translating into a large open FX position of 28.3 percent of GDP in the corporate sector. Sectors with lower export ratios and weaker debt service capacity hold a sizeable portion of FX loans. In an adverse scenario of more rapidly than expected tightening global liquidity, a new round of currency depreciation would put more strain on already stretched balance sheets of corporates, depressing already weak private investment and lowering GDP growth. Although banks are not allowed to have net open currency positions themselves, balance sheet pressures in the corporate sector might pose risks to the banking sector.

22. **A growing funding gap in the banking sector is becoming a binding constraint on growth.** Domestic lenders have increased loans faster than deposits, with the loan to deposit ratio breaching 120 percent. The banking sector has covered the shortfall by external borrowing, which reached to USD 160 billion in August 2016. Going forward, banks have limited scope to support further loan growth because low saving rates significantly limit the ability to attract new deposit, uncertainty on global liquidity constrains foreign borrowing, and low profitability discourages capital increases.

23. **Government revenue is increasingly dependent on consumption and therefore highly vulnerable to domestic demand slowdowns.** The share of taxation of consumption in tax revenues is high, with indirect taxes now making up over 50 percent of total central government tax receipts and almost 13 percent of GDP. The increase in consumption taxes can be explained by both increases in the tax rates on consumption goods (e.g. the special consumption tax) and the strength of domestic demand over the last decade. The correlation between real GDP growth and
real central government revenue growth is strong. In addition, the scope for additional consumption tax increases may be limited without risking base erosion, because tax rates on some of the items that make up the special consumption tax are already high.

**Developments in Investment**

24. **The strong economic performance was accompanied by rapid growth in investment.** Investment in real terms more than doubled from 2001 to 2008, rising to 23.5 percent of GDP in 2008. After a large fall in the 2008-09 global financial crisis, investment quickly bounced back in 2010-11 and has plateaued at about 24 percent of GDP (Figure 1). High growth in investment was fueled by the growth in private investment, which accounted for 82 percent of total investment in 2014. Meanwhile, real public investment remained relatively stable. Recent developments indicate a slowdown in public investment and stable private investment in 2015, which means the contribution of investment to growth in an accounting sense was very small.

25. **High investment growth fueled an extensive expansion in infrastructure and urban growth.** A tremendous expansion of the inter-city road network took place: the length of Turkey’s motorways and dual carriageway highways increased to more than 20,000 kilometers in 2013, from a little over 2,000 km in 2002. Investment in the housing and other construction sectors have increased by 68 and 43 percent over the 2006-14 period, and accounted for 2.6 and 1.4 percent of GDP in 2014 (Figure 2). Total investment grew on average by 9.8 percent in 2000-2007, with 9.7 percentage points (pps) coming from the private sector and only 0.1 pps from public investment. However, the post-crisis environment during 2010-2015 shows a very different trend. Public investment added on average 1.3 pps, while private investment shaved 1.2 pps off annual investment growth, leading to a stagnation in investment during 2012-14.

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26. **Turkey’s investment rates resemble those of European economies.** Unlike the fast growing Asian economies, where the growth model depends heavily on investment-intensive, export-oriented sectors and investment accounts for around 40 percent of GDP, investment spending in Turkey accounts for only about one fifth of GDP. Turkey’s investment to GDP ratio is comparable to its peers in Latin America and Developing Europe, well below the 30 percent investment Japan and Korea had during their take-off periods last century.\(^{14}\) Turkey’s investment to GDP ratio averaged 20.3 percent in 2012-14 period, compared to 21.5 percent in Latin American, 20.7 percent in Developing Europe, and 41.6 percent in Developing Asia (Figure 3).

27. **The sectoral composition of investment changed after the 2001 crisis compared to the previous decade.** The reforms in the early 2000s created the foundation for the expansion of the role of the private sector in the economy. The reforms brought much needed macroeconomic stability, and an improved business climate, thus creating opportunities for the private sector. First and foremost, this incentivized the private sector to shift resources from housing to other sectors, particularly to manufacturing. The share of housing investment in total private investment averaged 41 percent in the 1990s, but then sharply dropped to 18.3 percent during 2000-07. Instead, the private sector channeled its investment largely to manufacturing, energy, transport and communications, increasing their combined share to 60 percent of GDP in the 2000s from about 45 percent in the 1990s (Figure 4).

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**FDI**

28. Turkey has attracted relatively little FDI in recent years compared with similar countries. Despite broad economic reforms in the 1980s culminating in capital account liberalization in 1989, yearly FDI inflows averaged about 0.5 percent of GDP between 1990 and 2004 because of domestic inefficiencies, persisting controls and red-tape.\(^{15}\) However, reforms in the legal framework lowering the barriers to foreign investment in 2003, and the start of accession negotiations with EU in 2005 helped to increase FDI inflows above 3 percent of GDP (Table 1). Improvements in institutional quality or at least the expectation of improvements with the start of the accession negotiations also helped increase FDI flows. The global economic crisis, however, together with stagnation in the EU accession process led again to lower FDI flows declining to 1.6 percent in 2014 from 2.1 percent of GDP in 2011, despite the quick economic rebound from the slowdown during the global crisis in 2009.\(^{16}\) Nevertheless, FDI inflows to Turkey displayed an improvement and increased to 2 percent of GDP in the last two years.

| Table 1: Average inflows of FDI investment in emerging economies (percent of GDP) |
|------------------------------------------|----------|----------|----------|----------|----------|
| Turkey                                  | 0.2      | 0.4      | 0.8      | 3.0      | 1.6      | 2.0      |
| ECA Region                              | 0.6      | 1.6      | 4.1      | 6.7      | 3.5      | 2.7      |
| Brazil                                  | 0.7      | 1.4      | 3.4      | 2.4      | 3.2      | 4.1      |
| China                                   | 0.6      | 3.9      | 3.5      | 4.4      | 3.3      | 2.4      |
| Malaysia                                 | 3.2      | 5.8      | 2.8      | 3.9      | 3.1      | 3.4      |
| Mexico                                  | 1.2      | 1.9      | 3.2      | 2.7      | 2.4      | 2.3      |
| India                                   | 0.0      | 0.4      | 0.8      | 2.1      | 1.8      | 1.9      |
| Russian Federation                      | ---      | 0.7      | 1.5      | 3.7      | 2.8      | 0.8      |
| South Africa                            | 0.0      | 0.6      | 1.7      | 2.1      | 1.6      | 1.1      |

Source: World Development Indicators.


\(^{16}\) Sánchez-Martín, Escribano, and de Arce, 2015.
Public Investment

29. Public investment growth slowed with increasing privatization. In the 1970s, the public sector’s share in total investment hovered around 40 percent with an average growth rate of public investment reaching almost 10 percent. This period was characterized by an import substitution industrialization strategy with an ambitious public investment program aiming to increase domestic production of heavy manufacturing and capital goods. In the late 1980s, the growth rate of public investments shrank to an average of 1.6 percent due to the liberalization process. The deceleration in public investments continued after the 2001 crisis in line with the International Monetary Fund (IMF) program. Public investment declined from 10 percent of GDP in the 1970s to 7 percent of GDP in the late 1980s and finally averaged 4 percent of GDP in the last decade. After the conclusion of the IMF standby agreement in 2008, public investment started to increase again. However, quasi-fiscal entities’ investments and investments through public private partnerships (PPPs), which are not reported under total public investments, increased rapidly in the same period. Since 2008, public private partnership investment values have reached around 41 billion USD which corresponds almost 78 percent of total PPP investment value in the period of 1987-2016. The PPP investments’ value accounted 0.7 billion USD and 2.5 billion USD respectively in 2015 and 2016.

30. The share of public investment in total investment fell in industry and agriculture, while private investment saw a significant increase in core infrastructure. The share of the agricultural and industrial sectors in total public investment eased considerably in the last 20 years as a result of privatization in these sectors. Importantly, the public sector started to concentrate more on social and core infrastructure areas in the last decade despite a fall in investments in the communication sector after the sale of Turk Telekom (privatized in 2005). The private sector successfully compensated the slowdown in public investments in the related areas with investment in agriculture, mining and manufacturing averaging 7.3 percent of GDP in the last decade compared to 4.9 percent between 1990 and 2000.

31. Government policies have recently aimed at improving social infrastructure (education and health) in lagging regions. While public investments remained largely stable in the last decade, the regional distribution changed significantly in favor of lagging regions. Their share in total public investment increased especially in the social sectors. For instance, the average share of Northeastern Anatolia) in total investment almost doubled in the last 5 years compared to the previous 5-year period on the back of increasing investments in health, education and housing sectors. Reallocation of public spending toward underdeveloped regions has been an important driver of the improved social conditions across the country. For example, in Northeastern Anatolia, these policies were successful as the utilization of healthcare services in the region almost tripled in the last decade.

32. The increasing concentration of public investment in core infrastructure has had a positive impact on private investment growth. There is evidence that public investment in core infrastructure, defined as energy, transportation and communications, crowds in private investment. The estimated impulse responses show that an unexpected rise in public infrastructure investment at year 0 has no effect (or a slight crowding out) in the short run on private infrastructure investment, but in years 3 and 4, private infrastructure investment rises by 0.5 percent, suggesting a medium-term crowding in effect. This result is consistent with similar
estimates in other countries that show evidence of crowding-out in the short term, while public investment may compliment private investment in the medium-term to long-term.\(^{17}\) It is also consistent with the dynamics of public debt reduction, which have created fiscal space for social spending as well as reduced the risk of crowding out.

**Physical Capital Accumulation**

33. **Despite the considerable pace of accumulation, Turkey’s physical capital stock remains low relative to countries with similar per capita incomes.** Turkey’s per capita physical capital stock more than doubled since 1990, outpacing large Emerging Market peers such as Brazil, Russia and South Africa (Figure 5). Althought Turkey somewhat caught up with its peers thanks to its strong investment performance over the years, its per capita physical capital stock still remains low; Turkey is comparable to countries with a per capita GDP about 30 percent lower (Figure 6).\(^{18}\)

**Corporate Leverage and the Banking Model**

34. **The economy’s growth in the last 15 years has been built on increasing corporate debt ratios, amid comfortable but falling capital adequacy of banks.** Turkey’s growth model relied on banks borrowing abroad in foreign currency, and on-lending to Turkish firms similarly in foreign currency. This along with cheaper global financing in the aftermath of the global financial crisis led to a precipitous increase in corporate leverage. The debt-to-equity ratio of Turkish non-financial enterprises increased to about 160 percent in 2014, from around 90 percent in 2004. The composition of liabilities shifted increasingly from equity towards long-term debt in non-financial enterprises, while the share of short-debt in liabilities remained mostly unchanged around 37 percent.

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\(^{17}\) Mitra, 2006.

\(^{18}\) Cross-country capital stock comparisons rely on Penn World Tables.
35. **Turkey’s corporate sector now has the highest leverage among major economies.** While some developed countries deleveraged following the global financial crisis, Turkey is among the few countries that increased its leverage even after the crisis thanks to robust banking sector that withstood the global financial crisis. Moreover, Turkey’s corporate sector is the most leveraged sector among the countries for which data is available (Figure 7). However, return on equity is higher than that in many other countries, save Germany. Corporate profitability dropped in most countries in the aftermath of the global financial crisis. South Korea is the only country in our sample that managed to raise its profitability after the crisis, while Turkey, Poland and Italy maintained pre-crisis profitability levels. The share of short term liabilities makes up almost 70 percent of the total debt for small enterprises, dropping to just 63 percent for large enterprises. The construction sector, which will be discussed in detail in Chapter 3, is much more heavily leveraged than average Turkish firms: the debt-to-equity ratio of construction companies was around 275
percent in 2014. Leverage compensated for a slowdown in the growth of equity capital. However, much of the increased leverage was poured into ‘other assets’, with stagnation in tangible and intangible fixed assets. Instead, corporates utilized debt in order to offset the slower increase in equity, and also in order to build up different assets (Figure 8).

36. Increasing corporate leverage has been financed by a much-improved banking system after the 2001 reforms. The success of the broad economic reforms following the 2000-01 crisis owed much to banking system reforms. Most importantly, governance weaknesses were addressed, by holding bank owners accountable and giving regulators full independence. The crisis led to more cautious policy making concerning the financial sector, and therefore Turkey’s non-bank financial sector and its capital markets remain far less developed than those of major economies. Total financial system assets amount to about 180 percent of GDP (emerging market average is about 195 percent, and newly industrialized Asian economies 620 percent). Banks represent about 85 percent of the financial sector and about 120 percent of GDP. The banking system remains well capitalized (capital asset ratio of 16 percent) and profitable (return on assets and return on equity of 1.2 percent and 11.3 percent, respectively), with an improved asset quality (non-performing loan ratio of 3.2 percent, after reaching 5 percent in 2009). However, it should be noted that capital adequacy, liquidity and profitability are all decreasing since the global crisis. Despite significant progress to deepen the capital market, the diversity of corporate debt instruments is limited, banks dominate issuances and bonds are almost exclusively floating rate securities with an average maturity of 265 days and overall less than 3 years to maturity.

37. The banking sector has limited access to long-term finance, a critical obstacle to private sector growth. The banking system is funded mostly by stable customer deposits, backing 53 percent of total assets. However, about 88 percent of the sector’s deposits had maturity below 3 months, while 77 percent of the lending was concentrated above 3 months. Characteristically, only 4 percent of deposits had maturity of over 1 year, dropping to only 1.3 percent for TL deposits. The result is a negative liquidity gap (i.e. more liquid liabilities than assets, also known as the liquidity mismatch risk) that peaks in the 1 to 5-year maturity. Nevertheless, the banking sector is aligned with Basel-III liquidity coverage ratio standards and banks have exceedingly met those standards. Banks have drawn on balance sheet liquidity and wholesale funding from abroad (with foreign liabilities to total assets standing at 22 percent). However, maturity of the sector’s foreign liabilities reaches 4.5 years. Longer term sources of foreign debt, through for instance securitizations and subordinated debt, remain limited and constitute less than 15 percent of the total. Only 1.2 percent of total assets are funded by TL bonds, while the weighted average of the maturity remains under 1 year. These imbalances are reflected on the bank loan portfolio and the enterprises’ liability structure. About 50 percent of bank loans have less than one year remaining maturity, 36 percent between 1-5 years, and only 14 percent above 5 years. Overall, the banking sector is increasingly experiencing performance headwinds due to maturity mismatches, decreasing capital and profitability ratios, increasing reliance on foreign borrowing, and growing uncertainty and tighter liquidity conditions in global markets.

Human Capital

38. Turkey has made significant progress in increasing access to schools. Turkey has achieved almost universal primary school enrollment of 96.4 percent, and secondary enrollment was at 79.8 percent, both as of 2015-16. The Government is actively seeking to expand secondary
school enrollment to comply with the new “4+4+4” law on education, which mandates compulsory education up to grade 12. The gender access gap has disappeared in primary education and narrowed significantly in secondary education; although there are variations by location. Challenges remain, however, in access to preprimary education (three- to five-year-olds) and higher education, where enrollment rates are rapidly increasing but remain well below the OECD average.

39. **In parallel with rising enrollment rates, Turkey’s quality of education has improved.** PISA seems to be a good predictor of economic growth—far better than average schooling level—and there is international evidence that an increase of 50 points in PISA scores is associated with about 1 percentage point higher annual growth (Hanushek and Woessmann 2007<sup>19</sup>), an impact that shows in the medium term as cohorts enter the labor force and lasts for a long time. Turkey’s average PISA performance scores have improved significantly since 2003. The latest PISA results (2012) show that while Turkey students score behind the OECD average by 35 PISA points (almost a full year); the gap has rapidly declined from the 65 points it was in 2003. While Turkey has also reduced the share of students below basic proficiency levels since 2003, this proportion remains above the OECD levels. For instance, around 22 percent of Turkish 15-year-olds do not read well enough to sufficiently analyze and understand what they read and are therefore considered by the OECD to be “functionally illiterate.”

40. **The average improvement in PISA scores in Turkey has gone hand in hand with reductions in the inequality of educational achievement.** For example, the performance of the students from the poorest quintile of the population improved by 56 points between 2003 and 2012, much higher than the 25-point rise for students from the richest quintile. However, despite some progress in narrowing the achievement gap between students from the richest and poorest income quintile groups, the gap between both groups was still about 93 points (or more than two years of education) as of 2012. Looking ahead, Turkey must build on its achievements to further expand quality and broaden access to good education for all.

<table>
<thead>
<tr>
<th>Education Type</th>
<th>State Universities</th>
<th>Foundation Universities</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associate</td>
<td>1,683,044</td>
<td>67,089</td>
<td>1,750,133</td>
</tr>
<tr>
<td>Undergraduate</td>
<td>3,139,516</td>
<td>231,172</td>
<td>3,370,688</td>
</tr>
<tr>
<td>Master</td>
<td>206,014</td>
<td>56,738</td>
<td>262,752</td>
</tr>
<tr>
<td>Doctorate</td>
<td>60,227</td>
<td>5,637</td>
<td>65,864</td>
</tr>
<tr>
<td>Proficiency in Art</td>
<td>490</td>
<td>34</td>
<td>524</td>
</tr>
<tr>
<td>Total</td>
<td>5,089,291</td>
<td>360,670</td>
<td>5,449,961</td>
</tr>
</tbody>
</table>

Source: CoHE 2014:16.

41. **The number of students in tertiary education tripled since the beginning of the 2000s.** The number of students increased to 5.5 million in the academic year 2013-14, from 1.6 million in 2001<sup>20</sup>. Tertiary education entrance rates for university level programs stood at 41 percent in 2012, compared with 18 percent in 1995. Programs at higher vocational schools attracted 30 percent of

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<sup>20</sup> The number of students increased to 6.1 million in the academic year of 2015-16.
secondary school students, up from 9 percent in 1995.\textsuperscript{21} The OECD averages for the two rates were 58 and 18 percent, respectively. Most students are in state universities, but foundation universities—private non-profits—are on the rise (Table 2).

42. **The rise in student numbers was accompanied by rapid growth in the number of tertiary education institutions.** Since 2003, the number of universities increased from 79 to 176, of which 104 are state institutions and 72 are non-profit foundations (Figure 9).\textsuperscript{22} In addition, there are 8 independent post-secondary vocational schools, and 6 other higher education institutions, i.e. military and police academies.\textsuperscript{23} This increase is comparable to the expansion seen in some other European countries.

![Figure 9: Number of Tertiary Education Institutions, 1982-2014](image)

**Source:** Yavuz 2015.

**Note:** Devlet – state; Vakif – foundation/private; Toplam – total.

43. **However, with the rather recent increase in the number of tertiary education institutions and students, levels of tertiary education attainment still remain comparatively low.** While many EU countries have exhibited enrollment rates of 50 percent and more at the tertiary education level for some time, the tertiary education attainment rate of the 25-34-year age group in Turkey just crossed the threshold of 20 percent in 2012, compared to 9 percent in 2000. Turkey’s human capital stock is comparable to countries with per capita income 50 percent below Turkey’s (Figure 10).\textsuperscript{24} With respect to the overall working-age population, the share of adults with tertiary education within the 25-64-year age group only increased from 8 to 15 percent between 2000 and 2012 (Figure 11) while the difference between age groups is smaller than in

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\textsuperscript{21} Since entrants to the university programs can be vocational school graduates, entrance rates for both levels cannot be added up to calculate the overall tertiary education entrance rate. OECD 2014a:334, 336.

\textsuperscript{22} Republic of Turkey 2014:31.

\textsuperscript{23} CoHE 2014:5ff.

\textsuperscript{24} Human capital stock refers to human capital per worker index published by Penn World Tables.
many other countries. The OECD average for 2012 stood at 33 percent. However, tertiary education attainment rates differ widely between regions (Figure 11).

![Figure 11: Adults with Tertiary Education in the 25-64 Years Cohort, 2005 and 2015](image)

Institutional Capital

44. **Improvements in the policy and institutional environment supported productivity growth in the 2000s.** The impact of the 2001 crisis catalyzed a decisive shift towards rule-based economic governance. The process of EU accession also played a significant role in the adoption of these mechanisms, particularly in the period between the establishment of the EU-Turkey Customs Union in late 1995 and the opening of accession negotiations in 2005. However, reform momentum faltered when the enthusiasm about accession faded. In 2008-09, crisis management took center stage, and then complacency set in when the initial rebound from the crisis seemed robust. Turkey needs to reinvigorate the reform momentum going forward to raise the growth potential.

45. **The quality of Turkey’s economic institutions falls short of countries that have successfully transitioned to high income, and the gap is widening.** Turkey ranks well below 50 on common indicators measuring the quality of economic institutions, and the distance to the top has been widening (Figure 12). Comparing data available at the end of 2013 and the beginning of 2016 shows that Turkey is falling behind in major indicators of institutional quality. While these indicators all show Turkey’s position vis-à-vis others, the negative development is also visible in the levels of business climate indicators: business climate reforms have slowed since 2008 (Figure 13). Indicators for voice and accountability actually started back-sliding.  

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26 OECD 2014a.
27 Ibid.
46. **Some legislative initiatives have contributed to a worsening of institutional quality in recent years.** The creation of independent regulatory agencies (IRAs) with considerable operational and financial independence supported growth in the period before the global financial crises (Zenginobuz 2008).28 However, in mid-2011 the Government made fundamental changes in their independence and operations. Decree No. 643 issued in June 2011 stated: “the IRAs may be directly attached to the respective ministries, based on the order of the Prime Minister and the President’s approval.”29 Then, in August 2011 followed Decree no. 649, which stipulated that “the [respective] minister has the authority over all transactions and activities of the related, attached and affiliated agencies.” Further, by Decree No. 666, compensations of staff and board members at IRAs were fixed to the levels of government officers. This reduces the IRAs’ attractiveness for

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29 Translation from Ozel 2012.
the highest-quality staff and might lead to an erosion of their technical capacity over time. Finally, financial independence could be reduced by a change in public finance legislation in 2005, which requires IRAs to transfer surplus funds from their own revenue collection to the central government on a quarterly basis.

47. **An example for the difficulties emerging is with regard to the electricity transmission company and the energy regulator.** Turkey’s Electricity Transmission Company (TEIAS) is facing challenges maintaining the stability of the transmission grid. Grid operation is becoming more complex with high energy demand growth that is increasingly met by intermittent renewable energy resources operated by the private sector (the Government aims at a rapid buildup in renewables). A robust load dispatch, system planning, and investments in infrastructure are critical to maintaining the integrity of the grid. There is room for improvement regarding TEIAS’ capacity in areas such as access to finance, recruiting and retaining staff, procurement, and decision-making. Another example is the Energy Market Regulatory Authority (EMRA). It was established in 2001 as an independent, administratively and financially autonomous institution. Recently, its auditing responsibility of electricity distribution companies has been transferred to Ministry of Energy and Natural Resources (MENR) with the 2013 Electricity Market Law.

**Economic Growth History and Prospects**

48. **Several episodes of economic development in postwar Turkey can be distinguished, marked by changing political circumstances.** Turkey has had four above-average growth episodes (Figure 14): the highest average growth rates were in the 1950s, with 6.4 percent total factor productivity (TFP) growth reflecting the post-war recovery in demand and efficiency gains from agricultural reform. The second best performance occurred from 1961 to 1977, when average growth reached 6.1 percent. This period was characterized by central planning and import substitution, and high public investments. Following the military coup of 1980, the Turkish economy entered another vigorous growth episode under the Özal government thanks to wide-reaching economic liberalization. The final above average growth episode occurred during the early 2000s, during which the country was enjoying an average growth rate of 5.2 percent. However, from 2009, growth has been driven mostly by increases in labor force participation and employment. The chart shows clearly that political stability was closely related to positive TFP growth: negative growth periods coincide with coups and unstable coalition governments.
49. **Over the medium-term, private investment in the Turkish economy may face significant headwinds.** The reform momentum of the early 2000s was lost during the 2008-09 global crisis. After the strong recovery that lasted until about 2011, the loss in momentum became apparent and growth slowed. Worse, the business climate weakened and Turkey ranks 69th globally in Doing Business. A succession of elections created uncertainty and a ‘wait-and-see’ attitude. On the back of these developments, the contribution of private investment to growth has been limited since 2012. Going forward, the external environment is unlikely to be conducive to high growth and investment. The US Federal Reserve raised interest rates in December 2015 for the first time in nearly a decade, ending the near-zero borrowing costs in the United States. While a more competitive exchange rate could help in the medium term, depreciation and volatility has strained balance sheets and raised the debt service burden of the corporate sector, which has large open foreign exchange positions.

50. **Growth prospects depend on largely exogenous factors, such as the rate of labor force growth, and largely endogenous factors, including the rate of human and physical capital accumulation, and factor productivity growth.** The growth accounting framework can be used to estimate a baseline scenario for potential growth of the Turkish economy through the period of 2016-25. The assumptions for our baseline scenario are based on recent developments, but we lowered some of the numbers from the high-growth period in the 2000s because of the worsening international environment, questions about education quality, and deterioration in the quality of institutions. The key assumptions are as follows.

- Average employment growth will be 2.5 percent per annum (the average for 2002-15 was 2.6 percent).
• Average growth in schooling of the working age population will be 1.6 percent (with mean years of schooling to increase to 8.5 by 2025 from 7.5 in 2014).
• Investment growth will be 5 percent (1980-2014 was 5.1 percent, while 2000-14 saw 6.8 percent).
• TFP growth will be 0.8 percent (average 1980-2010).

51. **In light of the difficulties facing private investment, growth will be driven by human capital accumulation.** The reason behind an increase in the contribution of human capital is the extension of compulsory years of schooling and improvements in female labor force participation. With these assumptions, baseline potential economic growth is estimated to be about 3.5 percent up to 2025 (Table 3). This baseline growth rate likely would be insufficient to create enough jobs for the increasing labor force in industry and modern services, and unemployment or low-paid, low-productivity employment would rise. It is enough, however, for Turkey to continue its convergence to income standards of the EU, albeit slowly. Decisive action to improve the business climate and factor accumulation could raise the GDP growth rate above 5 percent. A faster increase in schooling (similar to the Korean experience) could boost growth to 3.7 percent. Rapid increases in TFP in line with the 2002-09 average would raise the growth rate by 0.5 percentage points. High employment growth in line with the record job creation during 2010-15 could increase growth to about 4.1 percent per year (this would mean female labor force participation converged with the OECD average by 2035). In a combined scenario, where there are improvements in investment, female labor force participation and average years of schooling, the potential growth rate would surge to 5.1 percent, one third faster than in the baseline scenario. Finally, if in addition TFP growth continued at the rapid pace of the early 2000s through the implementation of a strong structural reform program leading to improvements in the quality of institutions and the business climate, average GDP growth would increase to 5.6 percent per year and Turkey would reach almost 80 percent of average EU incomes by 2025. These scenarios are only indicative. It is hard to imagine major improvements in investment and the contribution of human capital, for example, without decisive changes in institutions and business climate.

<table>
<thead>
<tr>
<th>Table 3: Potential GDP Growth Scenarios (2016-30) (Percentage change)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (B)</td>
</tr>
<tr>
<td>B+1 Fast Increase in Schooling</td>
</tr>
<tr>
<td>B+2 High Employment Growth</td>
</tr>
<tr>
<td>B+3 High TFP</td>
</tr>
<tr>
<td>B+4 High Investment Growth</td>
</tr>
<tr>
<td>B+1+2</td>
</tr>
<tr>
<td>B+2+4</td>
</tr>
<tr>
<td>B+1+2+4</td>
</tr>
<tr>
<td>B+1+2+3+4</td>
</tr>
</tbody>
</table>

**Source:** World Bank
Conclusions

52. This chapter has discussed investment into physical, human, and institutional capital since the early 2000s. It showed that the government played a pivotal role in supporting the accumulation of physical assets by building infrastructure, which crowded in private investment and helped connect firms to markets throughout the country. However, the capital stock remains low for Turkey’s level of income. Public investment declined as a share of total investment with the privatization of many public entities. Private investment, however, has lacked dynamism in recent years amid domestic and international difficulties. Re-kindling this dynamism will be needed to reach economic growth rates that are sufficient to create good jobs for Turkey’s growing labor force, and thereby reduce poverty and increase shared prosperity. The chapter highlighted the following challenges.

- **Improvements in the lack-luster investment flows in recent years face headwinds from increasing leverage in corporate balance sheets, and diminishing lending head room of banks.** Development of capital markets is therefore crucial to provide stable sources of long-term financing, which now shows high dependency on external (and volatile) financing in a bank-centric model. Economic growth remains vulnerable to the risk of external financing difficulties. Developing deeper and longer-term bond markets – notably local currency bonds – as well as equity markets would help diversify and provide more stable financing for productive real-sector activity, and reduce any excessive dependency on banking intermediation and transformation risks. Challenges to develop the capital markets further in Turkey include low levels of savings, investors’ preferences for short-term investments, the relatively small size of the institutional investors and their short term maturity profile, limited diversity of corporate debt instruments, low cost-effectiveness of funding through domestic capital markets vis-a-vis financing through banks or the international capital markets, and low liquidity in the secondary markets of the corporate bonds.

- **In addition to a low but improving physical capital stock, human capital is at a low level but improving rapidly.** However, there are indications of skills mismatches, but it is not clear whether they relate to the lack of generic skills, technical profiles, institutional set-ups, or the organization of learning. There are also questions over the quality of education, in particular in light of Turkey’s relatively weak performance in research and innovation.

- **The quality of institutions needs to improve to catch up with high income countries.** Turkey is ranked below the top 50 in the most important institutional quality indicators. The quality of institutions (regulatory institutions to ensure market functioning and the rule of law) is one of the most important determinants of investment (including foreign investment as shown in Chapter 5). However, not only is the level of institutional quality lagging, but Turkey has lost its position in important indicators in the last two years, i.e. Turkey’s institutional quality is declining relative to other countries.

53. Thus, the chapter has shown that Turkey’s capital stock is relatively low, and growth will largely depend on its ability to improve factor accumulation and boost productivity through structural reforms. In particular, the stock of human capital is relatively low, and Turkey significantly lags behind other OECD countries. Turkey’s economic growth will be limited to about 3.5 percent per year with reasonable ‘business-as-usual’ assumptions about investment in
physical and human capital and productivity growth. Decisive action to boost female labor force participation, improve the quality of education, and improve the quality of Turkey’s institutions could support significantly higher growth.
3. GETTING HOUSING INVESTMENT RIGHT

54. Housing constitutes perhaps the most important part of household wealth and well-being, and while it is not production capital, it is closely tied to economic growth via its important backward and forward linkages to other sectors. It can be both an engine for employment-intensive growth, and is supported by income growth and the concomitant increase in demand. It can play a major role in economic growth and economic stabilization, through the creation of jobs in construction and materials, and indirect impacts through subsidiary activities, including infrastructure and services. In addition, housing finance is closely related to financial sector developments and monetary policy, and is typically of systemic importance for the health of the banking sector, which in turn supports investment and growth.

55. This chapter looks at the housing market under two aspects: Is housing investment at the right level, at the right place? And, is housing finance conducive to the development of housing? Section A provides an overview of housing developments in recent decades. It points at the successful provision of housing to fast-paced immigration from rural areas, which avoided the build-up of slums seen in many developing countries. Section B covers the question of spatial development. While it is difficult to generalize when it comes to real estate, which is very location-specific, housing construction seems to have kept pace with housing demand, at least insofar as can be read from housing outlays by households: for most Turkish households, the share of their total spending going to rent and utilities has been fairly stable in the 2000s, although that is not the same for low-income households, who have seen housing costs rise relative to their budgets. However, cities now increasingly add high-rise housing in the periphery, which creates urban sprawl and environmental costs. Section C discusses housing finance, pointing out that mortgage availability is low, in particular for low-income households, and that in general, access to finance and financial development have much room to grow. Part C provides conclusions and policy recommendations.

Overview

56. Construction of new buildings has seen a tremendous rise over recent decades in line with Turkey’s fast urbanization. We can distinguish three periods of rapid population movements since the foundation of Turkey (Figure 16, Panel 1). 30 The first period was from the 1960s through the 1980s, while the second urbanization wave took place in the period between the 1980s and the end of the 1990s, which was interrupted by the 2001 economic crisis. The third big rural-urban population movement started after the crisis, and is still ongoing, albeit at a slower rate. The construction of new buildings has been closely associated with these periodic population movements.

57. Residential construction declined precipitously in the 2001 crisis, but has since reached its pre-crisis level amid much volatility. Currently, 86.1 percent of all newly completed buildings are constructed for residential purposes in Turkey. 31 In line with the recovery of production levels after the 2001 crisis, the cost of residences reached the pre-crisis level also (Figure 15, Panel 2). The fluctuation in the construction sector growth rate is sharper than that of

30 Pamuk, S., Türkiye’nin 200 Yıllık İktisadi Tarihi, 2014.
the manufacturing industry. Analysis suggests construction and manufacturing sectors both co-move with GDP growth (Figure 16).

Figure 15: Residential Construction, 1960-2015


Figure 16: Comparison of Construction and Industry
(Contribution to GDP and growth rates)

Source: TurkStat (Statistical Indicators), Calculation: The Economic Policy Research Foundation of Turkey (TEPAV)

58. **Turkey’s housing market is concentrated in three big cities.** House sales have been increasing in the 2000s and reached over one million units in 2013-14 (Figure 17). Nearly one fifth of all transactions in 2014 are in Istanbul, 11.3 percent are in Ankara and 6.2 percent are in Izmir. Note that there is significant market volatility evidenced by the yearly changes in sales and a significant market growth in 2013 fueled by sales outside of the three key markets of Istanbul, Ankara and Izmir (Figure 18). New house sales accounted for 46.5 percent of all transactions in Turkey in 2014. In 2014, mortgages funded 33.4 percent of house sales, down from 39.8 percent in 2013. The 2014 mortgage house sales-to-total house sales ratio of Ankara (37.9 percent), Istanbul (38.9 percent) and Izmir (37.1 percent) are above Turkey’s average. Foreign buyers
preferred Antalya, with 6,542 units sold to non-residents, followed by Istanbul with 5,580. House sales to foreigners went up 56 percent in 2014.

![Figure 17: Housing Sales Dynamics](image1)

![Figure 18: Housing Sales Dynamics – Main Markets](image2)

**Figure 17: Housing Sales Dynamics**

**Figure 18: Housing Sales Dynamics – Main Markets**

Source: Directorate of Land Registry and Cadaster (GDLRC) and TurkStat

![Figure 19: Profitability of Construction and other Industries, 2008-12](image3)

**Figure 19: Profitability of Construction and other Industries, 2008-12**

(thousand TL, in 1998 constant prices)


59. **Investment in the housing sector was overwhelmingly done by the private sector, and constitutes a large part of overall investment.** While construction cooperatives had an important market share in the 1980s and 90s, they nearly disappeared in the 2000s. The public sector’s share increased somewhat, but remains small. Private investment in the housing sector accounted for about 16 percent of total private investment during 2009-14. Growth in real private investment in the housing sector averaged 2 percent per year during the same period, which was in line with other sectors. However, housing investment has shown considerable volatility: after a 30 percent fall in 2009 and a short period when growth averaged 20 percent in 2010-11, private investment in housing grew by 2 percent in 2012 and contracted by 8 percent in 2013. In 2014, growth is

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32 The Land Registry Law (2644) regulating acquisition of property by foreigners was changed in 2012.
estimated have reached 8 percent. The swift recovery in production volumes after the 2008-09 crisis came at the expense of profitability: profits per firm or per worker fell continuously since 2008, while overall industry profits show more positive momentum (Figure 19).

60. **Most developers use off-plan sales, i.e. units are sold against sizeable deposits prior to construction.** Developers explain that they need to establish demand and secure funding. Off-plan sales reduce risks for the developer and thereby financing costs, but push the risks onto buyers, which makes this a consumer protection issue. In fact, the consumer protection law was amended in 2014 to give greater protection to buyers. It now specifies that developers can only sell within 36 months of delivery and after having obtained the necessary licenses as well as construction completion insurance. Buyers can cancel sales contracts without penalties if the property is not delivered after 36 months. On the other hand, some developers have started offering housing finance to households, for example developer credit at zero interest for two years, which may be a sign of demand saturation. This may show that some construction companies have detected falling opportunities, i.e. higher market risk in the high-end segment.

![Figure 20: Liquidity Ratios for Turkish Firms, 2012-14](image)

**Source:** Central Bank of the Republic of Turkey (CBRT), World Bank staff estimates.

61. **The construction sector is more highly leveraged and has less liquid assets than other Turkish industries.** The share of equity in total funding is 27 percent in construction, compared with 38 percent in manufacturing. The debt to equity ratio in the construction sector is around 2.75, which is significantly higher than 1.62 for the average firm, but comparable to 2.67 in wholesale and retail. In addition to higher indebtedness, the construction sector also relies more on short-term funding, which makes up a share of 44 percent of overall funding compared to 40 percent in manufacturing. Construction companies hold less liquidity than other sectors, and liquid assets and marketable securities can only cover 18 percent of short-term liabilities, compared to 30 percent in manufacturing sector (Figure 20).

62. **Despite lower returns on assets, returns on equity in the construction sector is comparable to manufacturing thanks to higher leverage ratio.** The returns on assets averaged
2.9 percent in the construction sector between 2012 and 2014, lower than 4.2 percent in the manufacturing sector. However, because of significantly higher leverage in the construction sector, returns on equity averaged 10.3 percent, very similar to 10.6 percent in the manufacturing sector in this period.

**Is housing investment at the right level, at the right place?**

63. **Since the 1950s, Turkey has dramatically transformed from a largely agrarian and rural to a modern and urban economy, all the while accommodating record numbers of migrants in decent housing.** Urbanization has helped create economic dynamism in modern industry and services sectors, which grew to contribute 27 and 64 percent of GDP in 2014, respectively, from 17 and 26 percent of GDP in 1950. Productivity improvements were made possible by strong agglomeration economies. The speed with which nearly three-quarters of Turkey’s people moved to the cities was significantly higher than in most other developing countries.33 Yet, apart from temporary, low-quality squatter housing estates emerging mainly in the 1990s, Turkey has avoided the creation of the kind of sprawling slums that are a familiar sight in cities in, say, India and Brazil. This was in large part achieved through, paradoxically, amnesties that granted property rights to squatters on public land, by helping them to invest in their properties, and incentivizing and supporting cities in providing municipal services to these communities.34

64. **However, over time urban sprawl and urban congestion have come to threaten the benefits derived from agglomeration economies.** While the three largest cities (Istanbul, Ankara, Izmir) accommodated the most migrants, secondary cities grew faster in the 2000s, and along with growing populations in these ‘Anatolian tigers’ a growing number of firms is providing employment. However, rapid deregulation of building activities has contributed to a changing city landscape, with ubiquitous ‘satellite cities’ and urban sprawl emerging in the hitherto green hills surrounding many cities.35 Cities look more ‘convex’: low-rise buildings in centers, and high-rise apartment towers and offices in the periphery. In fact, the population growth rate has been significantly higher the greater the distance from the average Turkish city center during 2000-11, reaching 55 percent in a distance of 20km or more from the center, in contrast with 30 percent in the core cities.36 Such a development pattern increases costs of municipal infrastructure provision, leads to long commutes, and is not equitable: the lack of expansion of housing in the centers drives up prices there, and lower-income groups are relegated to the periphery and hours spent in crowded minibuses.

65. **In addition to the distribution of housing within cities, housing sales and population changes are not a good match between cities in recent years.** Between 2013 and 2015, housing sales increased the most in central Anatolia and provinces in the South East and East (Bingöl, Bartın, Karabük, Muş, Gümüşhane and Kars, Figure 21). During the same time period, the population has increased the most in the North-West, the Aegean region, the South-East and the big cities (Tekirdağ, Kocaeli, Antalya, Yalova, Muğla and Ankara, Figure 21). The maps reveal that housing sales in Turkish cities cannot be explained by the increase in the population. Other

33 World Bank, 2015.
34 World Bank, 2015.
36 World Bank, 2015.
factors like urban planning differences, geographical factors including availability of land, income levels have a role in the determination of the variations in housing sales.

Figure 21: Housing Sales and Population Changes, 2013-15

Housing Changes

![Housing Changes Map]

Population Changes

![Population Changes Map]


**Financing of Urbanization**

66. **Growing urban centers and the metropolitan municipalities have large financing needs to ensure that infrastructure keeps up with populations.** Turkish cities finance about 45 percent of their budgets with own source revenue (OSR), with the remainder being provided largely by transfers from central government and a small part through loans.\(^{37}\) The composition of OSR is similar to comparable countries, with taxes and fees the most important source (about 22 percent of total OSR). However, revenue from taxes and fees lacks buoyancy because of small taxation of the fast rising value of properties. Property taxation generates much less revenue than in the OECD and some European countries (0.2 percent of GDP in Turkey, 1.1 percent of GDP OECD countries average).\(^{38}\) The reason for such low property taxation is partly found in the revenue assignment: property taxes accrue to towns and boroughs within metropolitan municipalities, which are only responsible for solid waste collection and some urban roads. This provides few incentives to metropolitan governments to set and towns and boroughs to collect property taxes. Even if necessary changes to taxation can be made, however, the tax base is not well known because of deficiencies in property valuation. The hitherto transactions based taxation leads to under-declaration of property values and mechanisms for independent verification do not

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\(^{38}\) Ibid.
exist. Local user charges are another element that could be greatly expanded, if the example of OECD countries is followed.

**Market Segments**

67. Supply of residential real estate by private developers is concentrated in the high end of the market serving the upper quintiles of the income spectrum. Over the last 5 years, the residential construction sector has been growing steadily. Recent production was over 760,000 apartments (over 70,000 multifamily buildings) in 2014 and 880,000 apartments (over 84,000 multifamily buildings) in 2015. On average, 931,000 units were produced annually over the last 6 years (2010-2015). Unfortunately, we do not have data on the split by market segment for the overall construction numbers. The number of newly constructed single-family houses remains stable at between 20,000-25,000 per year, which means the overall growth is due to the increase in multifamily construction. Interestingly, the average unit size (150 m²) or number of units per multi-apartment building remained stable over the last decade, which suggests a predominance of luxury, relatively low-rise buildings with large apartments. While construction permits show high quarter-on-quarter volatility, some private-sector construction companies perceive excess supply in the market for housing units and thus are slowing down new projects. For example, companies reported that they are shifting their focus from the highly competitive high-end residential market segment to less competitive segments, such as industrial buildings.

68. The public sector intervenes in the housing market through Turkey’s Housing Development Administration (TOKI). Since 2003, it has built over 750,000 units divided into two groups, social housing and higher-income housing (fund-raising projects), with a simple plan: it develops higher-income housing to cross-subsidize social housing. The data on annual construction of units for different market segments is sparse. TOKI reports that the average split between luxury and social construction is 15:85. The “middle income” units have the size of 87-146 m²; while units for the “poor” and for “low-income” programs are considerably smaller at 45-65m² and 65-87m², respectively. If we simply assume TOKI builds 57,700 units annually (the result of dividing 750,000 completed units by thirteen years), average annual socially-oriented construction matches more than 9 percent of the average yearly total market supply. In turn, this volume is divided into 3 sub-programs – “for the very poor”, “for low income” (together accounting for 36.23 percent of all TOKI volume including TOKI’s urban renewable projects) and “for the middle-income” (43.08 percent of all TOKI volume). This translates to approximate yearly volumes of 20,900 very poor and low income and 24,850 middle income units per year representing 2 and 4 percent of the aggregate national construction volume, respectively. Without knowing the split by market segment of overall housing construction, it is not possible to gauge whether TOKI has a major influence on the construction of housing for lower income groups.

69. TOKI also supplies finance for the purchasers of its apartments. With the programs for the poor and low-income households, TOKI targets families with monthly income of TL 3,200 or less. This corresponds to the lower deciles of the urban and rural population in Turkey’s 2013 household survey, i.e. the majority of the population has access to these units. Programs for “middle-income” do not have even this high limitation and thus TOKI directly competes with the rest of the construction and mortgage sector. Housing projects of TOKI are heavily oversubscribed and allocated by lottery. Whatever TOKI’s footprint in the market, it does not use realistic targeting
to allocate social housing to lower income groups. Its housing units are therefore heavily oversubscribed and allocated by lottery.

**Recent Real Estate Price Evolutions**

70. **House prices have increased significantly, with major urban centers leading the way.** The CBRT Housing Price Index for Turkey (THPI), the CBRT New House Price Index for Turkey (TNHPI), REIDIN Residential Sales Price Index (RSPI) and REIDIN-The Association of Real Estate and Real Estate Investment Companies (GYODER) New Home Price Index (NHI) reveal robust house price appreciation in recent years. Major metropolitan areas, including Istanbul, Ankara and Izmir, appear to continue to be benefitting from rural-urban migration.³⁹ According to the CBRT THPI (Figure 22), there is evidence of localized higher house price growth in Istanbul and Izmir where the median annual price appreciation was, 13.4 percent and 11.9 percent in the last five years, respectively, compared with a median of 11.5 percent for Turkey as a whole. The annual median growth for all homes in Ankara was 9.8 percent in the last five years. New homes appreciated faster than older homes, with a median annual price appreciation of 12.5 percent since January 2010, compared with 17.3 percent in Istanbul, 11.0 percent in Izmir and 10.9 percent in Ankara (Box 1).

71. **There is also evidence of localized higher house price growth in Ankara, Istanbul and Izmir where the median annual price appreciation was close to 9 percent in the last decade, compared with a country median of 8 percent.** The median monthly growth in Istanbul reached 0.8 percent in the last decade, compared with a country median of 0.7 percent, and compared with 0.6 percent in Ankara and 0.7 percent in Izmir. The RSPI for Turkey is rising at a median quarterly growth rate of 2.3 percent in the last decade, compared with 2.5 percent in Istanbul, 2.2 percent in Izmir and 2.0 percent in Ankara (Figure 23). According to the REIDIN-GYODER NHI for Turkey, new homes have shown a median annual price appreciation of 7.8 percent since January 2010.

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**Figure 22: CBRT THPI**

**Figure 23: REIDIN RSPI**

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³⁹ Istanbul is an outlier as it accounts for 19 percent of all property sales and 23 percent of mortgage transactions and is likely to skew country averages.
The robust house price growth has outrun the increase in house rents, leading to rising price-to-rent ratios. Compared to other OECD countries, the ratio in Turkey indicates that purchase prices are overvalued (Figure 24). If house prices are too high relative to rents, potential buyers should find it more advantageous to rent, which in turn should exert downward pressure on house prices.

Box 1: Limited comparability of the different house price indices in Turkey

The CBRT and REIDIN offer Turkish house price indices; however, there are significant differences. For example, the CBRT uses property prices stated on valuation reports prepared by appraisal companies at the time of mortgage origination, and REIDIN uses listed residential sales offer or ask prices for the calculation of their indices. In addition, the CBRT gets property price data from banks, and REIDIN uses a sample of listings. Considering these differences and index characteristics, values of the CBRT and REIDIN house price indices are not directly comparable, although the values appear to be similar during some periods.

CBRT price indices

The CBRT maintains an THPI, an TNHPI and house price indices for 26 geographical units. The THPI considers prices stated on property valuation reports prepared by real estate appraisal companies at the time of mortgage origination. 74 cities are included in the THPI calculations. The TNHPI considers prices stated on valuation reports of newly built properties. According to the CBRT, seven cities, i.e. Bayburt, Bingöl, Gümüşhane, Kilis, Siirt, Şırnak and Tunceli, are excluded from the THPI calculations. 37 cities are included in the TNHPI calculations.

The THPI and TNHPI are calculated using the Chain Laspeyres Index method and the monthly series start in January 2010. The CBRT collects data from banks on a monthly basis using a standardized form. By design, prices of properties sold to cash buyers and to buyers taking out a loan from a non-bank or a non-domestic bank are not considered in the THPI and TNHPI. Further the house price indices are relying on the assumption that the median unit price of the appraised properties is indicative of the median unit price of the sold properties.

REIDIN-GYODER price indices

REIDIN offers indices and data such as a Housing Affordability Index (HAI), Rental Affordability Index (RAI), Residential Sales Price Data (RSPD), RSPI, Residential Rent Value Data (RRVD), Residential Rent Value Index (RRVI) and the REIDIN-GYODER New Home Price Index (NHI). Index series which are asterisked below are calculated monthly and cover seven cities (Adana, Ankara, Antalya, Bursa, Istanbul, İzmir and Kocaeli), their 71 districts and 481 sub-districts. REIDIN uses a sample of over 200,000 listings per month, a “stratified median index” approach and a Laspeyres price index formula for the calculation of the asterisked indices.

- **HAI**: Calculation considers average monthly mortgage payments on a home and the average monthly disposable income of a household. The index value is set at 100 in June 2007.
- **RAI**: Calculation considers the average monthly gross rent and the average monthly disposable income of a household. The index value is set at 100 in June 2007.
- **RSPD**: Shows the weighted average housing sales price evolution in Turkey. The data series starts in January 2003 and is calculated monthly.
- **RSPI**: Shows the weighted average housing sales price index evolution in Turkey. The index value is set at 100 in June 2007 and is calculated monthly.
- **RRVD**: Shows the weighted average residential rent value evolution in Turkey. The data series starts in January 2003 and is calculated monthly.
- **RRVI**: Shows the weighted average residential rent value index evolution in Turkey. The index value is set at 100 in June 2007 and is calculated monthly.
- **NHI**: Calculation considers a sample of housing sales price and real estate stock data of real estate developers. The index value is set at 100 in January 2010 and is calculated monthly.
Housing affordability

73. The affordability situation provides an important insight into the discussion above.\(^{40}\) Thus, if affordability is high, i.e. a large share of the population has adequate access to suitable financing options to satisfy their housing needs, then the current homeownership share is likely to remain stable and the growth in mortgage finance may come from new family formation as well as replacement of the housing stock. On the other hand, if affordability currently is low, then homeownership is constrained (by incomes, mortgage product features or house prices) and may increase at the expense of rentals.

74. Average rental and mortgage costs are currently not high relative to household incomes, but they have increased greatly for households at the bottom of the income distribution. On average, household housing-related expenditures (rental or ownership payments plus utilities) is benign and fairly stable around 26 percent of household expenditure. However, for families at the top of the distribution, these expenditures have become easier to shoulder, while families in the lowest income decile spend 10 percentage points more of their overall spending on housing and utilities than in 2005 (Figure 25).

Is housing finance conducive to the development of housing?

75. Low income households face difficulties accessing housing finance. Low-income households often do not have sufficient savings to make the required 25 percent down-payment. In addition, housing loans have short tenors and high nominal interest rates, which may not be affordable, as seen from the household income distribution data. Lenders currently offer shorter-term (up to ten years, average eight years) housing loans with a statutory minimum 25 percent down-payment; the average loan-to-value (LTV) is low at around 65 percent. An average mortgage from a commercial bank of around TL 100,000 with monthly payments of about TL 1,435 would be affordable only for the top two deciles of urban families and barely the top decile of rural

\(^{40}\) Here defined as share of the population by income that can purchase appropriate housing with the help of available mortgage solutions. As a rule of thumb, a balanced market exists where the median or better of the population by income has access to housing solutions.
families. Thus, bank housing finance solutions only reach the very top segment of the population. In response to difficulties faced by low-income households, the government introduced in its 2016 program a 15-20 percent matching contribution to individuals saving for the required 25 percent down-payment. While this will help some families accessing mortgages, loan origination needs to be carefully managed to avoid sub-prime risks.

Turkey’s mortgage market is underdeveloped with respect to its peers. Although about 40 percent of house sales are financed by banks, these statistics do not translate into a well-developed industry overall. Thus, less than 4 percent of homeowners have a mortgage; whereas in European countries with well-developed mortgage markets homeowners have mortgages in the 30-40 percent range (Figure 26). The mortgage sector is small, with total assets outstanding of less than 7 percent of GDP and 10 percent of all banking sector loans in 2014. In this respect, Turkey is in line with key regional comparators, e.g. Kazakhstan or Russia, but significantly lags behind more developed mortgage markets, e.g. Germany, Poland or France.

The public sector housing agency (TOKI) also provides housing finance solutions. It has three mortgage programs – “for the poor”, “for the low income” and “for middle income”. The latter portion of TOKI housing finance business (41 percent of all TOKI volume or 23,000 loans per year or 6 percent of aggregate national mortgage lending), at least in terms of eligible apartment size and key loan terms (25 percent down payment, 10-year term) matches the property and mortgage characteristics from commercial banks, i.e. average loan amount is reasonably expected to be around TL 120,000. Since the maximum income limit is absent (but the minimum income is implied by the “lower income” program maximum of TL 3,200 per month) from borrower eligibility criteria for these loans, it is likely that a prudent repayment capacity is used in line with market average and thus effective interest rates are also close to the market average of 12 percent per annum. For the “poor and lower income” portion of TOKI housing finance (23 percent of all

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41 This presumes reported average mortgage term of 10 years and interest rate of 12 percent.
42 LITS, World Bank, as at 2012.
43 For social housing finance TOKI uses a monthly-resettable loan amount and interest rate scheme (tracking the public sector wage index or Producer Price Index (PPI) or Consumer Price Index (CPI)), interest rate comparison to the prevailing market conditions uses fixed rate mortgage repayment scheme for consistency.
TOKI volume or 12,000 loans per year or 3 percent of aggregate national mortgage lending) property and borrower eligibility criteria include unit size and maximum household income. The latter covers deciles 1-8 of the urban population and 1-9 of the rural population. These loans have little to no down payment requirement as well as very small monthly payments. Implied interest rate on these loans is less than 2 percent, if converted to a fixed rate mortgage for consistency. Overall, TOKI provides truly affordable mortgage solutions with a significant subsidy to 3 percent of all mortgage borrowers (on average 12,000 families per year).

78. **Turkey has an adequate institutional and legislative framework, however, capacity in traditional institutional investors is low, and they lack funding sources other than deposits.** Traditional institutional investors in long-duration, low-yield mortgage-backed securities are pension asset managers and insurers. In less developed markets, banks play the pioneering role and often allocate a share of their investment portfolio to either covered bonds or structured instruments in order to achieve higher yield than sovereign bonds. Housing finance related capital market products (such as covered bonds) are slowly emerging, and incentives for domestic institutional and private investors to hold those assets are limited. At the same time, other long-term instruments are also quite limited. For example, Turkey’s private pension scheme introduced in 2003 has grown significantly but still remains small with an average duration of members only at 3 years. Private pension companies hold mainly public-sector debt securities.

Conclusions

79. **This chapter has discussed developments in Turkey’s housing sector.** It has acknowledged the significant successes in managing a rapid urbanization process through a tremendous expansion in housing, which was only temporarily slowed during the global financial crisis. Turkey counts internationally competitive construction companies among the 15,000 or so private firms that make up the industry. State intervention in the sector has been implemented mainly through TOKI, which acts as a developer in partnership with private firms. While it is hard to generalize anything in the real estate sector because of its location-specific nature, we can nevertheless draw some conclusions and provide policy recommendations. These are the following.

- **Turkish cities increasingly develop in the peripheries, rather than through redevelopment and increasing densities in the centers.** Such a development pattern increases the environmental footprint of cities, and dilutes the benefits of agglomeration through congestion. A second-generation urban development agenda would therefore focus on planning, connecting, and financing cities, in particular in the 14 metropolitan municipalities newly created in March 2014. Planners will have to look at medium- to long-term population projections and devise environmentally, economically, and socially sustainable patterns for future development. This would help in delivering larger-scale and more complex infrastructure systems, and coordinate land use planning with infrastructure delivery across the metropolitan footprint.44
- **Property and land valuation and taxation play particularly important roles in efficient city development.** Well-functioning land markets alongside appropriate zoning and an enabling environment for urban redevelopment would ensure higher density

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44 World Bank 2015.
development in centers rather than in the periphery. One option to start creating incentives for efficient spatial development is increasing property taxation. Turkey’s current system of taxation relies mostly on transaction taxes, which lead to understatement of actual values in real estate transactions and registration, and create incentives to hold on to properties rather than allow reallocation in line with market forces. Property taxes would also greatly improve buoyancy and predictability of municipal revenues.45

- **House prices have increased significantly, with major urbanizations leading the way, but do not seem excessive.** The house price growth has outrun the increase in house rents, leading to rising price-to-rent ratios. Compared to other OECD countries, the ratio in Turkey indicates that purchase prices are now overvalued. Despite the increase in housing costs, average household expenditure on housing and utilities has been a fairly stable, and not excessive, share of overall expenditure. However, the sharply increasing burden on low-income households gives rise to concerns.

- **The increasing price-to-rent ratios incentivize households to postpone purchases and rent instead.** This would lead over time to an adjustment in the ratio through lower purchase prices and higher rents, which would hit low-income families relatively more, because they are much more likely to be renting.

- **The mortgage industry is underdeveloped and largely inaccessible for low-income households.** Mortgages are relatively expensive with short tenors, and low-income households often are not able to provide the required 25 percent down payment. The government recently started providing matching grants to help families come up with the down payment. Turkey has an adequate institutional and legislative framework, however, capacity in traditional institutional investors is low, and they lack funding sources other than deposits. The government also aims to promote more general financial sector development, and mobilization of private saving, which would improve mortgage availability over time.

45 Ibid.
4. HUMAN CAPITAL ACCUMULATION THROUGH HIGHER EDUCATION

80. Education achievements and therefore Turkey’s human capital have expanded greatly in the last one and a half decades. Starting from a low level, Turkey’s students improved their scores faster than their peers in the OECD PISA studies in recent years. Turkey’s transition from middle to high income requires upgrading its production to higher value-added segments in global value chains. This chapter first briefly discusses the outputs of the higher education system focusing mainly on the wage premium and more general on the value for money measures for the substantial public outlays that are expended on tertiary education. It highlights shortcomings, in particular weak outputs in terms of excessive graduates in some areas (like social sciences and humanities) that can generate skills mismatches, as well as innovation indicators. The chapter then discusses aspects of the governance system for tertiary education, which is highly centralized in the CoHE and lacks effective quality control. It severely limits universities’ ability and incentives to improve outputs and compete with each other; however, the CoHE started to address the issue of profile diversification via particular programs. The quality assurance system is also not in line with Turkey’s commitments in the Bologna process, which aims to promote the convergence of European university systems. Finally, the chapter presents Turkey’s progress toward introducing LLL, which is at an early stage.

Outputs of the Education System

81. Turkey has a greater share of students that received a short-cycle tertiary qualification (as opposed to a Bachelors’ degree) than OECD countries and the country also has many more graduates from social than engineering and technical subjects. In 2012, most first-time graduates – 57 percent – were awarded a bachelor’s degree or equivalent, while 41 percent received a short-cycle tertiary qualification. On average, the distribution of first-time graduates across OECD countries exhibits a greater share of bachelor’s degree holders (the rates were 69 percent and 18 percent, respectively). Even though there are possibilities for graduates of short-cycle programs to continue with bachelor’s degree programs, a maximum of 10 percent of graduates from higher vocational schools uses this possibilities, according to estimates by the European Training Foundation (ETF 2012:64). Further, Turkey currently has many more graduates in social sciences fields compared to other fields like engineering more related to research and innovation. This is not something peculiar to Turkey and is shared by many other OECD countries (OECD, 2014; Arias, & Sanchez-Paramo, 2014). This illustrates that the expansion of tertiary education was mainly achieved through ‘low cost subjects’ like social sciences despite the continuous needs for graduates from technical subjects. And the growth in number of graduates in the social sciences has increased over the years. This poses a market failure, as students often lack information on the returns to different careers. Improved governance and financing arrangements would give employers a stronger say in the provision of tertiary education and make it more demand and performance-oriented, as well as more attuned to global trends, as will be discussed later.

Returns to Education

82. Turkey’s tertiary education graduates are in high demand and earn significant wage premiums. The economy faces a lack of skilled individuals required for further development,
however, and the system performs relatively poorly in research and innovation, while public spending on tertiary education has increased. This section reports on returns to education, performance in research and innovation, and value for money of public investment in tertiary education.

83. **High private benefits from tertiary education indicate high demand for the outputs of the education system.** Turkey’s average college-wage premium has remained stable and mostly unchanged since the early 2000s. The average college wage premium is high and comparable to other middle- and high-income economies. As with many other countries, the wage premium for tertiary education significantly varies across the wage distribution. In most countries, college wage premiums are either insignificantly different or higher at the top than at the bottom of the wage distribution. Tertiary education provides an earning advantage when comparing the best-paid (less-paid) college-educated workers with the best-paid (less-paid) workers with a secondary education. Both people’s skill stocks and use of skills at work closely affect variations in labor earnings. Indeed, according to the results of 2015 Survey of Adult Skills conducted by OECD, tertiary-educated adults are more proficient in literacy and especially numeracy proficiency than those without an upper secondary qualification. Across most of the countries, workers belonging to the poorest quintile will earn less than workers from more socio-economically advantaged households. In Turkey, the college wage premium increased at the top of the socio-economic distribution and fell at the bottom, which has led to higher wage dispersion across salaries. However, the wage premiums very likely vary by field of study.

84. **Rates of return can provide evidence of the extent to which education pays off in terms of higher earnings.** Overall, the rate of return to education increases with higher education degrees, among those with wage jobs, although returns substantially drop in the informal sector. In Turkey, tertiary education graduates earn higher wages than secondary education graduates, and secondary education graduates earn higher salaries than primary school graduates. Private and public returns to tertiary education differ much more in Turkey than in the OECD on average. Private and public costs and benefits differ because of public subsidies to education, bursaries, and taxes. Compared to the average OECD country, private returns to tertiary education in Turkey are higher, while public returns are lower. In Turkey, those who benefit from the earnings differential paid to tertiary education bear less of the costs of the education, than in the average OECD country.

85. **Tertiary education not only increases wage rates, it also increases the probability of finding employment.** In 2012, employment rates within the 25-64 years age group were 76 percent for tertiary education graduates, 62 percent for individuals with upper secondary or post-secondary, non-tertiary education and 51 percent for individuals who did not complete upper secondary education (OECD averages were 83, 74, and 55 percent respectively; Figure 27). There is also a gender aspect worth highlighting, as women who have a higher education degree are much more likely to participate in the labor market (71 percent) and work in formal employment.47

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48 This could be further explored in subsequent studies using Labor Force Surveys.
49 Finn et al. (2013).
50 OECD 2014a.
51 Finn et al., 2013.
sum, the economic benefits to tertiary education are obviously high, although they vary by field of study.

Figure 27: Employment Rates of 25-64 Year-Olds by Level of Education, 2014

Note: 1. Year of reference 2011.

Research and Innovation

86. Research and innovation are held back by the rather small public research system, low levels of innovation activities within companies, limited entrepreneurial activities, and insufficient collaboration between research and industry. Turkey performs well below the OECD median in many respects, e.g. researchers’ publications in top journals, patenting in firms and the international dimension of innovation (Figure 29 and 31). Turkey’s performance in relation to other OECD countries in this respect remained more or less stable between 2011 and 2014 (Figure 28, 29, 30 and 31). In 2015, Turkey’s share of patents filed at the European Patents Office was 0.39 percent (1,090 in total), higher than the share of countries such as Luxemburg (0.21 percent) and Poland (0.30 percent), but well below the share of countries like Denmark (0.83 percent) or Belgium (0.85 percent). Several steps have been taken to improve the collaboration between research and industry in terms of both policy and incentives. On the other hand, the efficiency of incentives stands as a challenge for further improvement of collaboration.

52 Concerning the situation in Turkey, domestic patent applications have increased markedly in the recent two decades, according to data from the Turkish Patent Institute (http://www.tpe.gov.tr/TurkPatentEnstitusu/resources/istatistik/patent/patent_applications_with_respect_to_years.xlsx).

Figure 28: Competences and Capacity to Innovate, 2011

Note: Normalized index of performance relative to the median values in the OECD area (Index median = 100).
Source: OECD 2012:397.

Figure 29: Competences and Capacity to Innovate, 2014

Source: OECD 2014b.
Note: Normalized index of performance relative to the median values in the OECD area (Index median = 100).
Figure 30: Interactions and Skills for Innovation, 2011

Note: Normalized index of performance relative to the median values in the OECD area (Index median = 100).
Source: OECD 2012:397.

Figure 31: Interactions and Skills for Innovation, 2014

Note: Normalized index of performance relative to the median values in the OECD area (Index median = 100).
87. **Public investment in tertiary education in Turkey is similar to the OECD average, but it spends relatively little for its level of per capita GDP.** Tertiary education received public funding of 1.4 percent of GDP in 2013, compared with 1.1 percent of GDP on average in the OECD (OECD 2016:207). While there is evidence of rising public and private funding for tertiary education with rising per capita GDP, the numbers differ widely between countries. In fact, Turkey’s government spends a similar share of GDP on tertiary education as governments in advanced economies such as Germany, the United Kingdom, and Belgium, but spending is substantially higher in countries such as Canada, the US, Finland and Denmark (Figure 32). In all countries, the annual per-student expenditure is much higher at the tertiary level than at earlier levels. This is despite the high percentage of distance education in Turkey: about 40 percent of tertiary education students are enrolled in distance education, which would normally be expected to bring down the resources spent per student.

![Figure 32: Investment in Higher Education and Economic Development](source)

**Source:** World Development Indicators 2014 and OECD 2014a.

**Note:** Data is for 2011.

88. **Despite progress and an increase in spending in the tertiary education sector, outcomes remain comparatively low.** This can be seen in a number of factors. For instance, tertiary education entrance rates in 2012 stood at 41 percent for the university programs compared with 58 of the OECD. Moreover; it is reasonable to expect, given the high stratification of the education system, that the majority of the beneficiaries from the tertiary education expansion belong to households that are better off; even though presumably not as well-off as previous student cohorts. A sustained expansion of the sector could therefore lead to increasing benefits for households that are less well-off. Graduation rates in the sector remain low but improving and the proportion of graduates in the science, technology, engineering and mathematics (STEM) fields has remained stable since the 2000. Furthermore, private sector representatives note the lack of adequately skilled individuals in the labor force. This shortage points towards challenges related
to quality and a low performance of the system. This shortage refers especially to skills and professional knowledge relevant for innovation and competitiveness – i.e. relevant for the shift towards a new growth model. Finally, Turkey performs below the OECD median in researchers’ publication in top journals, and patents.

Governance of the Education System

89. This section describes the ubiquitous role of the CoHE in governing tertiary education institutions, the lack of effective quality assurance, and the arrangements for financing them. The previous section showed that high (public) investment has accounted for the expansion of education institutions, while challenges remain regarding the quality of education and the performance of the sector. Thus, it seems important to better align the tertiary education system to the requirements of an increasingly competitive environment. Part of the answer lies in introducing incentives on the one hand, and providing institutions with a framework that allows them to actively improve their performance on the other. Key conditions in this respect are changes to the current governance mechanisms, including quality assurance arrangements, and funding structures. Well-designed reforms in these areas can promote a stronger orientation towards strategic development and increase performance, inter alia by granting autonomy to institutions (especially with respect to spending funds strategically) and by introducing performance-based financing.

The CoHE

90. Turkey’s higher education institutions are governed by a highly centralized system that leaves little autonomy and incentives for performance. Turkey’s Tenth Development Plan (2014-18) provides a strategic framework for education. It promotes sensitivity towards the needs of the society and the economy, the translation of knowledge into benefits, as well as autonomy. However, the reality in Turkey is a highly centralized decision making structure. The CoHE has ubiquitous responsibilities: short- and long-term planning, appointing governing bodies’ core personnel, setting the student intake for all tertiary education programs, determining the number of different staff categories in universities, deciding upon the establishment of organizational units in universities, appointing deans, and deciding upon the transfer of staff from one institution to another. It is involved in setting the framework conditions on the one hand, and detailed administrative decisions at the institutional level on the other. The council is an autonomous body, but more than 50 percent of its members and its president are appointed by the state.

91. Governance at each individual institution consists of three levels and can be affected by government decisions. Institutions have an executive individual, i.e. a rector or dean, an administrative body, i.e. the university administrative board or the faculty administrative board, and a body responsible for academic matters, i.e. the senate or the faculty board. The rector is appointed by the President of the Republic of Turkey, as determined by the constitution. The deans are appointed by the CoHE. With respect to academic matters, faculties enjoy a certain amount of

freedom vis-a-vis the central level, but the overall approach to governance limits tertiary institutions’ autonomy.

92. The governance structures for foundation universities differ markedly from those for state universities. The basic preconditions for the establishment of a foundation university are that it is established by a foundation, observes certain provisions and is not-for-profit. Its establishment needs approval from the CoHE and the Ministry of National Education. While academic matters, the administrative structure, and quality assurance requirements are regulated in the same way as is the case for public universities, foundation universities enjoy a high degree of autonomy with respect to management and financial matters. This, for example, relates to budget allocations or the selection process of rectors and deans, for which the board of trustees is responsible and which only requires the consent of the CoHE.

93. The CoHE combines functions which in other countries are filled and executed by different actors. Other countries separate system oversight, strategic and legislative functions, determining funding, quality assurance, collecting and analyzing data, and developing policy options. The CoHE in Turkey is tasked with too many critical functions at the same time, which might not allow it to make in-depth contributions concerning particular functions. Examples are the theoretically strong but practically rather weak steering function concerning financing, preparing new legislation, independent policy analysis, and external quality assurance.

94. Therefore, tertiary education governance seems overly centralized and not able to address pressing current and future challenges. Interestingly, the CoHE came to this conclusion itself as highlighted in the institution’s “Strategic Plan 2015 – 2019”, which includes a detailed self-assessment. It highlights weaknesses in the overly centralized governance structure, and in legislation covering the sector. The government is currently on working on addressing these issues through amending relevant legislative framework. It even points out that the public holds a negative opinion about it, and that staff have concerns about their future, due to uncertainties about restructuring. Already in its 2007 Strategy Document, the CoHE had noted that it does not have the capacity to undertake all its responsibilities. In particular, the document noted that the CoHE had not been able to set incentives through education financing in the last 15 years.

Quality Assurance

95. A quality assurance system has been incrementally established since 2005, but it is still under development and there are open questions. Complementing institutional autonomy, adequate quality assurance mechanisms are needed to establish accountability and guide institutions towards relevant strategic goals. After Turkey joined the Bologna Process in 2001, the Academic Assessment and Quality Improvement Commission was created within CoHE in 2005, with a mission to promote and regulate comprehensive quality assurance. It issues standards and guidelines for academic assessment and improvement, and grants licenses to external quality assurance agencies. However, it lacks independence as required under commitments to the Bologna Process. Also, Turkey has not implemented the European Standards and Guidelines for Quality Assurance nor, through one of its bodies, become a full member of the European

56 The Bologna Process started in 1999 with the creation of the European Area for Higher Education to end the segmentation of higher education in Europe. See http://www.ehea.info/article-details.aspx?ArticleId=3.
organization of independent quality assurance bodies. Its performance, therefore, leaves room for improvement, as attested in Bologna Stocktaking reports (Figure 33 and 34).

**Figure 33: External Quality Assurance 2011-2012**

**Figure 34: Publication of Strategies for Quality Enhancement, 2010-2011**

Source: Bologna Stocktaking Report, 2012

96. **The Commission did not manage to develop comprehensive quality assurance functions and a new board created in 2015 is a lost opportunity.** Accreditation and evaluation as well as institutional and program level assessments would require a significant strengthening of capacity, given the extent of the tertiary education system to date. To fill the gap left by the Commission, specialized quality assurance bodies were developed in certain professional fields and started offering program accreditation, like Association for Evaluation and Accreditation of Engineering Programs (MUDEK) for engineering. However, these specialized bodies can only take up very particular functions. In a related change to the education law, tertiary education institutions were obliged to bring their programs in line with credit point and learning outcome requirements laid out in the national qualifications framework developed in 2010. Lately, the CoHE recognized the need to strengthen quality assurance to support growth and high quality of tertiary education and established a new Higher Education Quality Board in 2015. However, the new board is still affiliated to the CoHE, and thereby not in line with the independence requirement under the Bologna Process. Whether current efforts to change the respective legislation will alter this situation remains to be seen. The experience of Portugal shows that a fundamental overhaul of existing quality assurance structures can be successful (Box 2).

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59 i.e. European Credit Transfer and Accumulation System, Eriş and Durman 2011; Özcan 2011.
Box 2: External Quality Assurance in Portugal – A Radical Change of Directions

In Portugal, a new law created a quality assurance system in 1994. It put higher education institutions in charge of the quality of their provisions, without interventions of any inspectorate. This system was in place until 2006 without ever leading to closure of a program due to its low quality. This led to complaints that the system did not produce results, evaluation reports were obscure and did not make recommendations to the Minister and did not support decisions about the quality of programs.

In late 2005 the Ministry commissioned the European Association for Quality Assurance in Higher Education (ENQA) to undertake a review of the Portuguese quality assurance system. The aim was to develop recommendations for a new structure and for complying with European standards and guidelines. The major weaknesses were the limited independence of Portugal’s quality assurance system, the lack of sufficient operational efficiency and consistency, low internationalization, and above all, a serious lack of consequences of its decisions.

Following ENQA’s report, a new quality assurance system was implemented with a new Assessment and Accreditation Agency (A3ES), which was established as a private foundation. It is independent from the government and from higher education institutions. An important feature of A3ES is its Scientific Council which includes international quality assurance experts.

Under the new legal framework, the Agency is responsible for the assessment and accreditation of all higher education institutions and their study programs, taking into account the contribution of their internal quality assurance systems. Accreditation is compulsory. Nearly 30 percent of the programs which were in place when A3ES started its operations were discontinued.


Financing

97. **Tertiary education financing can be a key steering tool and a major factor underpinning the autonomy of institutions.** When it comes to public university financing, it is not only the overall levels of funding that matter, but also the mechanisms by which these funds are allocated and the latitude enjoyed by institutions in using financial resources. By allocating funds in a certain way, governments can emphasize missions and activities of tertiary education institutions and foster an orientation towards performance and outputs. Adequate funding mechanisms can incentivize institutions to deepen relationships with their environment, to orientate their programs towards skills that graduates need on the labor market, and to align all of their different activities with the requirements of technological upgrading within the economy. This is particular important at a time when higher education institutions move away from a ‘one size fits all’ model and set out to develop missions which are increasingly geared towards the regions in which they operate and their specific needs. Performance-based funding systems can, for example, incentivize skills provision for regional needs or successful knowledge transfer vis-à-vis local SMEs.

98. **Public universities receive their income from a variety of sources, but annual allocations from the central government budget are the most important.** In 2015, funds from the state budget amounted to 62 percent of state universities’ income. In addition, they receive aid from institutions, fees and other payments, income from publications and sales, income from property, revolving fund enterprises (such as hospitals, research centers, conservatories), and donations. Government funding comes in the form of line-item budgets. They contain at least 50 line items, albeit with possibilities for shifting resources between them. This approach to a certain extent limits the institutions’ financial autonomy. Adding to this, the annual budgetary allocations are distributed based on negotiations, which take into account the previous year’s expenditures.
and other criteria such as student and staff numbers, but lack a systematic orientation towards the actual performance of institutions. Subsequent to these negotiations, the budgets are submitted to the Ministry of National Education which has to defend them in Parliament. The negotiation process distinguishes the range of line items.\(^{60}\)

99. **The amount of tuition fees that can be charged for certain types of students and programs cannot be determined independently by institutions.** As of 2012, tertiary education institutions are not allowed to charge tuition fees from domestic students within undergraduate and graduate daytime and distance education programs who entered higher education via the central examination system.\(^{61}\) In other cases, universities enjoy some latitude in determining fee levels.

100. **External income can be generated and administered via revolving funds.** These funds can be established by the administrative board of a tertiary education institution or one of its organizational units, if the rector recommends this and the CoHE approves. An initial amount comes from the institution’s budget. Subsequently, the members of the organizational unit running the fund contribute to it via different activities that generate income. The main purpose of the fund is to support the activities that generate its income. Nevertheless, parts of it can be used to finance research within the organizational unit. Revolving funds can be transferred from one year to another.\(^{62}\)

101. **In contrast to public universities, which rely heavily on government funding, foundation universities have their own funds and raise additional income through tuition fees.** The latter are considerably higher compared to public universities, since fees can be determined by the board of trustees. Fees charged by foundation universities vary between USD 4,500-21,000 per year for undergraduate programs and between USD 3,000-19,000 per year for graduate programs. In addition to state aid, there are only a few public funds available for foundation universities, which are allocated on a competitive basis. To be eligible to compete for these funds, foundation universities have to fulfill several criteria, e.g. a specific age, a particular rate of full scholarship students and a certain quality of research.\(^{63}\) The higher amount of flexibility and ability to tap effectively into different funding sources contribute to success in terms of effective student preparation and transition to work of some foundation universities; however, a more systematic assessment on this would be needed.

102. **A funding model consisting of three pillars provides a good practice to follow.** Turkey’s annual budgetary allocations correspond to the basic funding component of the three-pillar model, which provides institutions with stable resources over a longer period of time. However, the other two pillars are missing. There is a lack of performance-based funding elements that could reward institutions for past performance or provide incentives to improve performance. Similarly, there is no support for strategic development, be it in the field of teaching, research or other activities (Table 4).

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\(^{60}\) (MoD n.d.b; Strategy Development Unit 2012:15f.)

\(^{61}\) Four types of programs are distinguished in Turkey: daytime education, evening education, open education and distance education programs.


Table 4: Criteria for a Good Tertiary Education Funding Model

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<tr>
<th>Criteria for a Good Tertiary Education Funding Model</th>
<th>Criteria for a Good Tertiary Education Funding Model</th>
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<tbody>
<tr>
<td>• Promote national strategies</td>
<td>• Provide clear, non-fragmented incentives</td>
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<tr>
<td>• Promote institutional profiles</td>
<td>• Avoid undesired effects</td>
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<tr>
<td>• Create performance rewards and sanctions</td>
<td>• Balance ex post and ex ante performance orientation</td>
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<tr>
<td>• Create a competitive environment</td>
<td></td>
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<tr>
<td>• Stability</td>
<td>• Provide unambiguous and balanced funding structures</td>
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<tr>
<td>• Guarantee continuity in funding mechanisms</td>
<td>• Make funding transparent</td>
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<tr>
<td>• Allow long-term planning</td>
<td>• Support the perception of fairness</td>
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<tr>
<td>• Take into account cost differences</td>
<td>• Allocate lump sums</td>
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<tr>
<td>• Promote risk-spreading and management</td>
<td>• Guarantee academic freedom</td>
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<tr>
<td>• Implement an adequate level of regulation</td>
<td>• Use available data</td>
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<tr>
<td>• Guarantee autonomy of internal resource allocation</td>
<td>• Ensure administrative efficiency</td>
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<tr>
<td>• Promote accessibility of diverse income sources</td>
<td>• Respect methodological standards</td>
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<td></td>
<td>• Ensure coherence with funding levels and steering approaches</td>
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LLL for the Knowledge Society

103. Successful knowledge societies have an integrated system of education that provides continuous skill formation over the life cycle of an individual. Key stages for the development of both cognitive and socio-emotional skills are identified. The education system begins with early childhood development (ECD) institutions laying the foundation for strong generic skills and, in particular, ‘learning how to learn.’ This follows research that identifies early childhood as a sensitive and critical period for inputs into the acquisition of cognitive and non-cognitive skills. In the Netherlands, for example, enrollment in educational institutions is compulsory from the age of 4; and in Denmark, 98 percent of children attend full-day institutions from ages 1-6 years. Non-cognitive skills appear to be more malleable throughout the life cycle; however, early interventions appear to have large positive effects and early childhood education for all children offers some of the highest expected returns to any investment in education.

Stages of Education and Learning

104. Recent government initiatives have focused on improving pre-primary education. The pre-primary gross enrollment rate has increased to 49.3 percent for children between 4 and 5 years old in recent years, with plans to increase it further to 70 percent, according to the Tenth Development Plan (2014–2018). Despite these improvements, pre-primary education rates remain low relative to other countries. Regional disparities also exist as western provinces have much higher enrollment than eastern provinces. Going forward, the focus of further quantitative expansion needs to be on disadvantaged regions and social groups with a view to more human capital endowment but also greater equity.

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64 The evidence from several studies surveyed in Cunha and others (2006) shows that intelligence quotient (IQ) is relatively stable after age eight, which implies that early childhood is the key period for the development of cognitive skills.
65 The recent Medium Term Program (2017-2019) also states that pre-school education will gradually become compulsory.
Attempts to improve LLL will need further attention. Based on Eurostat data, Turkey is slowly progressing toward its goal of 8 percent of adults aged 25-64 years participating in LLL programs by 2020. In 2014, this rate stood at 5 percent: an increase from 4 percent in 2013 and 3.2 percent in 2012 (Figure 35).

![Figure 35: Participation in Adult Education ('LLL')]

Source: Eurostat 2015.
Note: Mainly 2014 data.

In principle, the Turkish education system provides options for further learning. This is illustrated by technical and vocational education and training (TVET) programs for students who left school after primary education and by the possibility to access tertiary education after four-year TVET programs. Enrollment in these programs has increased considerably from 36 percent of upper secondary education in 2003 to 51 percent in 2013. Also, Turkey uses its available resources to increase participation in adult learning. Further reforms could focus on enhancing the tool-set for LLL and expanding the use of available policy tools. It is important to note that there are also apprenticeships programs of 2-3 years for students who left the system after primary education as an important vehicle for further learning and qualifications. These apprenticeship programs will be included into the compulsory education system, according to the medium term program for 2017-2019.

Conclusions and Policy Implications

This chapter has shown that rapid expansion of tertiary education is benefitting Turkey. However, returns to education are significantly higher for private individuals than for society as a whole, and the gap is larger than in average OECD countries. With tertiary education students largely from the better-off parts of the population, public subsidies as currently designed benefit the upper percentiles of the income distribution, while taxation of their relatively high incomes after graduation is too low to recoup some of the public investment in their human capital.
108. **Improving the skills of the Turkish population requires improving access to and quality of both the pre-primary and higher education sub-sectors.** Turkish policy makers have given significant attention to quality and equity of basic education in recent years. In contrast, the tertiary education sub-sector has seen a massive expansion but without comparable attention to the quality of provision. Given the recent work of the World Bank on pre-primary and basic education that outlines the achievements and successes of the government in improving access and quality of education, as well as the remaining challenges, the human capital section will focus on higher education.66 Further, tertiary education plays a critical role regarding the provision of advanced skills and fueling innovation and competitiveness – both being key for Turkey’s ability to move up the value chain.67

109. **At the same time, there are questions about the quality of education purveyed, and the tertiary education sector is performing poorly on its research and innovation functions.** Thus, it produces relatively low value for relatively high public investment. It therefore seems important to better align the tertiary education system to the requirements of an increasingly competitive environment. Part of the answer lies in introducing incentives and increasing the latitude of institutions to become active themselves by changing the current governance mechanisms, quality assurance structures and funding arrangements, including the introduction of performance-based financing. More autonomy could contribute to improved performance, especially within a framework of enhanced institutional autonomy.68 However, the CoHE’s ubiquitous responsibilities stand in the way of performance based financing. The importance of financial incentives is recognized by many stakeholders in the sector, but it can only work if there is a clear division of responsibilities between the government (the Ministry in charge of tertiary education) on the one hand and the university on the other. The combination of the two sides in the CoHE would generate a conflict of interest in any performance based financing process.

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5. Upgrading Institutions for Attracting FDI

110. Studies of the ‘middle income trap’ highlight the importance of the development of economic institutions and the rule of law in supporting capital accumulation and productivity growth. This chapter uses data on FDI to show empirically the importance of institutions for investment and growth. While our interest is in investment more generally, we are interested in FDI more specifically because it is more than just a source of capital for developing economies. Firm level-evidence in many countries shows productivity improvements for firms that receive FDI and productivity spillovers to local suppliers, which means FDI can boost productivity growth in the receiving country. In addition, at the macroeconomic level the composition of capital flow matters. For an open economy with a significant structural current account deficit, such as Turkey’s, FDI provides more stable funding than portfolio flows.

111. This chapter aims to assess first, whether FDI in Turkey has contributed to productivity growth through technology absorption and knowledge spill-overs and, second, identify significant driving factors for FDI. The methodology and details of the analyses are explained in Annex 2. The rest of the chapter is structured as follows: section A presents firm-level evidence of the impact of FDI on productivity in Turkey; it shows the results of econometric estimates of the impacts of FDI on productivity and employment, both for the firms receiving FDI and those ‘near-by’. The section concludes that overall, FDI has a positive impact on productivity in Turkey. Section B presents determinants for attracting FDI using cross-country data for Eastern Europe and Turkey; it shows results of a range of different specifications of models for the determinants of FDI, which highlight the importance of the EU accession process, the quality of institutions and the rule of law. Section C analyses the relation between FDI flows, skills and migration, which highlights the importance of education to transition out of the prevalent FDI into industries benefiting from low-wage labor into higher value added, skill-intensive sectors. In addition, we show that improving skills at home would reduce FDI outflow from Turkey to high-income countries, which is mostly skill-seeking. This chapter therefore highlights the importance of both institutions and human capital to support investment and high growth. Section D draws policy implications for Turkish policymakers.

FDI and Growth in Turkey: Evidence from Firm-Level Data

112. FDI had positive impacts on growth in Turkey, in addition to providing relatively stable financing for the current account deficit. Turkey benefited more from FDI than other countries in the region, where previous analyses have not always shown clearly positive impacts. These findings are based on econometric estimates based on firm-level data using an internationally comparable dataset. We highlight three different effects in this section: the effects on productivity and employment on firms receiving foreign investment themselves, the effects on their direct competitors, and effects on firms that are ‘close by’, i.e. they are suppliers or customers of the firms receiving FDI.

113. In line with the findings in other countries, the entry of foreign investors contributed to increased productivity in Turkish firms over time. Foreign investors mostly chose highly

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productive and growing Turkish firms to invest in, rather than building firms from scratch. However, even after controlling for this selection bias, the data shows that foreign investment came with new technology and know-how, but the impact on productivity was not immediate—only after four years was there a positive relationship between foreign ownership and firm productivity. In Turkey’s firm-level data set, our analysis shows that a doubling of foreign ownership was associated with a 1.1 percent increase in firm productivity. Similar analyses, for example of Latvia, Lithuania, Spain, and other eastern European countries lead to similar results: in general, it takes 3-5 years to realize potential benefits of FDI, because it takes time to disseminate technology and know-how. Foreign investment also initially had a positive effect on employment, but this effect reversed after four years. Domestic content requirements imposed on multinationals upon arrival, in terms of hiring local workers, would vanish after the fourth year. This is not surprising since the four-year mark is also when productivity started improving. Clearly, efficient use of labor explains part of the productivity improvement.

The presence of multinationals had a negative effect on competitors, but significant positive knowledge spill-overs on affiliated firms. The multinationals squeezed firms in their own sectors: when the foreign presence in a narrowly defined (four-digit) sector doubled, a domestic firm in the same sector had a 1.5 percent lower productivity due to competition and business stealing effects. On the other hand, domestic firms acting as suppliers or customers of the multinational saw their productivity increase, because of demonstration spill-overs. The boost in productivity was quite large with an average of 20 percent. These results distinguish Turkey from other countries in the region in that they show positive impacts of FDI on productivity. Other studies have shown that the competition spillover is usually negative both for developed countries in Europe and transition economies of Eastern Europe. However, the negative competition effect is smaller in Turkey, while the knowledge spillover is larger. The reason could be that Turkish firms are farther behind the technological frontier and best business practices than firms in emerging Europe. For the other emerging European countries, the reason why knowledge spillovers are negative may be the fact that even in the non-direct competition sectors there is business stealing, which dominates knowledge spillovers. Since these countries are closer in terms of know-how and technology and management practices to the core European countries, it is expected that business stealing effects dominate the knowledge spillover effects leading to an overall negative coefficient.

What Determines Foreign Investment? A Cross-Country Approach

Having thus shown positive impacts of FDI at the firm level, we turn to analyzing the macro-economic and policy factors that help explain FDI flows. Using a range of conceptual models that aim at explaining FDI flows, we analyzed a large cross-country dataset. The results show that GDP growth, macroeconomic and exchange rate stability, and law and order had clear positive effects in attracting FDI. The EU accession process helped anchor expectations about these variables and therefore contributed to attracting FDI.

The estimates show that GDP growth as a proxy for market growth is a significant factor in explaining FDI growth, but other factors are equally important. Macroeconomic

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71 Fons-Rosen et al., 2014.  
72 Fons-Rosen et al. 2014.
variables such as trade openness and inflation play a role, but are not statistically significant. Variables associated with higher GDP growth, e.g. infrastructure and privatizations are important. The prospects for EU accession clearly influenced investment decisions and anchored exchange rate stability expectations. Foreign investors viewed prospects for EU membership as a positive signal regarding the quality of macroeconomic management, political stability and institutional quality.\(^\text{73}\) Macro-prudential measures on volatile portfolio flows arguably helped reduce exchange rate volatility, which supported FDI inflows (Figure 36).

Among the institutional variables, law and order has a strongly positive effect on FDI inflows. Government stability and its capacity to implement programs and reforms also appear to have positive and significant impact on the attraction of FDI. Other institutional and political variables such as corruption control, bureaucracy quality and investment profile do not seem to attract more FDI as they improve over time. This may be because they are intimately related with the improvement of other institutional factors and relate closely to the general level of development of an economy. Transition variables are essential control variables in this group of countries, but they seem to have played a mixed role in fostering FDI. Indeed, on the one hand, the quality of competition policy and the progress in price liberalization have not contributed to attract FDI and large-scale privatization is positively and significantly associated with larger FDI inflows. Privatization provides investment opportunities that are related to competition effects or first-mover advantage seekers.\(^\text{74}\)

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**Figure 36: FDI and the Exchange Rate Risk, 1999-2014**

(Risk index 1-12, and percent of GDP)

![Figure 36: FDI and the Exchange Rate Risk, 1999-2014](image)

**Source:** World Bank Staff based on data from United Nations Conference on Trade and Development (UNCTAD), International Country Risk Guide (ICRG)

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\(^\text{73}\) Bevan and Estrin, 2004.

\(^\text{74}\) Bellak and Leibrecht, 2011.
Impact of Labor Skills, Higher Education and Migration on FDI in Turkey

118. This section explores the influence of skills, higher education enrollments (future skills), and skilled emigration and immigration on FDI flows in and out of Turkey. The analyses are based on the standard gravity model of international trade and FDI. The theoretical foundation of the gravity model makes it attractive for the analysis of factors determining foreign investment such as labor skills and skilled migration in emerging markets, as it incorporates both vertical (low wage seeking) and horizontal (skill seeking) motivations of FDI (see Annex 2 for estimation methodology). The section starts with exploring the impact of the Turkish diaspora on the location of both inbound and outbound FDI (network effect). We then investigate the extent to which the small, but growing population of expatriates and skilled immigrants as well as improving labor skills and university enrollments in Turkey affect FDI (skill chasing effect). The section then discusses economic implications.

Network effects of the Turkish Diaspora

119. The Turkish diaspora outside of Turkey as well as the relative stock of skilled migrants in Turkey had a significant impact on FDI, with a larger magnitude for outbound than inbound FDI. Our main interest lies in the impact of relative skill endowments, relative future skill endowments and the Turkish diaspora in the migrant receiving parent country. Our regressions show that in the aggregate, inbound investment rose with a relative increase in the skills in (high-income) parent countries relative to Turkey. Thus, Turkey predominantly attracts vertical or low-wage seeking FDI. However, parent country multinationals are investing in high-skill activities with an eye to the future with the expectation that Turkey will develop appropriate skills. Thus, higher education may be the key in transitioning Turkey from an economy that attracts FDI into low-skill production to one that attracts FDI into high-skill production. Meanwhile, higher relative skills and future skill endowments in host high-income countries such as the Netherlands and Germany continue to attract Turkish FDI. Thus, it is evident that a combination of relatively lower skill levels in Turkey and higher skill levels in high-income countries result in high-skill seeking Turkish investment abroad. Finally, the Turkish diaspora abroad has a positive impact on both FDI in Turkey and Turkish investment abroad. Thus, cultural and network connections are vital in attracting FDI into Turkey and for Turkish FDI abroad. Very similar results hold when replacing the overall Turkish diaspora with only skilled diaspora in the estimation.

Economic Significance

120. The results show a highly elastic and economically large negative response of outward FDI with increasing Turkish skills, and similarly, the prospects of future skills elicit a strong positive response of inward FDI. The magnitude of the coefficients is of interest in this analysis. A one percent increase in parent country skills relative to Turkey results in a 3.18 percent increase

75 The instrumental-variables procedure is to run the first-stage regressions of relative skill differences, relative future skilled differences, relative skilled migrants, total Turkish diaspora and skilled Turkish diaspora on the instrumental variables discussed above, along with other exogenous variables, for each sample and use the predicted values to estimate second-stage Tobit regressions. General specification tests are listed at the bottom of each second-stage regression in the tables below. As may be noted, the Sargan tests indicate with few exceptions that the variables are uncorrelated with the residuals and serve as appropriate instruments. The F-tests for weak instruments suggest that, except for a few cases the instruments perform well.
in inbound FDI into Turkey, while a similar increase in parent country skills relative to Turkey results in nearly two times as much increase in outbound FDI from Turkey. Hence, an impact of an increase in Turkish skill levels relative to skills in other countries will result in a decline in vertical FDI from abroad and a decline in Turkish skill-seeking FDI abroad; however, the former will decline by half as much as the latter. With regards to future skills, a one percent increase in Turkey’s future skills relative to the parent countries results in a 2.13 percent increase in inbound FDI. On the reverse, a one percent decrease in relative future skills (i.e. if Turkey falls further behind high-income countries) results in a 2.55 percent increase in outbound FDI from Turkey. Thus, university enrollments play a major role in attracting FDI and limiting outbound FDI. University enrollments also play a major role in attracting skill-seeking FDI, which in turn could help transition Turkey from attracting low-wage seeking FDI to skill-seeking FDI. Thus, a highly elastic and economically large response to both outward and inward FDI is found with a decline in relative stock of Turkish future skills.

121. Also, the total and skilled Turkish diaspora as well as the relative stock of skilled migrants had significant impacts on FDI although the magnitudes were considerably larger for outbound than inbound FDI. Turkish outbound FDI is not only chasing the general Turkish diaspora abroad, but particularly the Turkish skilled migrants. Also, while increases in skilled migration in Turkey relative to that of the high-income countries result in increases in inbound FDI, an increase in skilled migration into high-income countries relative to Turkey results in a significantly greater marginal increase in outbound FDI from Turkey.

122. The results suggest that while Turkey continues to attract vertical inbound FDI, the impacts of future skills indicate that Turkey is transitioning to horizontal FDI. In the meanwhile, relatively low levels of Turkish skills result in increasing outbound FDI and any declines in Turkish university enrollments relative to partner high-income countries will accelerate this process. The evidence clearly indicates that while the Turkish diaspora abroad helps inbound FDI, the marginal increase for outbound FDI is considerably larger and may slow the transition. Finally, the differences in magnitude may be due to the fact that skilled migration into Turkey is a recent phenomenon and involves mostly temporary expatriates, whereas in the partner industrialized countries such as the United States have a history of specific skilled migrant programs such as visas for persons with exceptional ability.

Conclusions and Policy Implications

123. Having first established the positive impacts of FDI on Turkey’s growth, the cross-country analyses highlighted areas in which government policy could help promote FDI. First of all, the existence of positive knowledge spillovers in Turkey calls for policies aimed at FDI attraction and in addition at facilitating the interaction between foreign and domestic firms. The latter would include programs for capacity building to allow domestic firms to become competitive suppliers for multinationals, and programs to co-locate domestic and foreign firms. Other results are summarized as follows:

- The EU accession process has played a positive role in attracting FDI in Eastern Europe. Re-vitalizing the process in Turkey is rightfully a government priority.
- Stronger institutions, including the rule of law, would make Turkey a more attractive destination for FDI. Government stability and law and order have been key determinants
of FDI in Eastern European countries. Actions to correct the perceived deterioration in law and order since 2011 would be likely to help enhance FDI attraction.

- Another significant determinant of FDI is the investment profile, which reflects contract viability (expropriation risk), profit repatriation policies, and likelihood of payment delays. Thus, strengthening the investor protection framework could potentially help reap some FDI gains, although in this case the empirical evidence is mixed.

- Exchange rate volatility affects FDI negatively. Prudent macroeconomic management including through the introduction of strong macro-prudential measures has mitigated exchange rate volatility caused by volatile short-term capital flows during the difficult period after the global crisis, but sharp depreciation since late 2013 has put Turkey’s image at risk. It would therefore be important to return to more orthodox monetary policy and improve its effectiveness in anchoring inflation and stabilizing the exchange rate.

- Promotion of skills upgrading of the Turkish labor force is important in supporting horizontal (skill-seeking) FDI in Turkey, and reducing similar outbound FDI.

- Facilitating skilled labor immigration into Turkey would help attract more horizontal FDI.\(^7\)

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\(^7\) The International Workforce Law No. 6735 was enacted on August 13, 2016. The Law simplifies bureaucratic procedures for skilled labor migration into Turkey by introducing Turquois Card System which is a new generation working permit system designed to attract skilled labor force.
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ANNEX 1: Returns to Capital Estimation

To estimate the return to capital in Turkey, we apply the methodologies in Bai, Hsieh and Qian (2006) and Caselli and Feyrer (2007). The nominal rate of return follows from a decision at the margin to purchase a unit of capital for use in production, given the prices:

\[ i(t) = \frac{P_y(t)\text{MPK}_j(t)}{P_{K_j}(t)} - \delta_j + \hat{P}_{K_j}(t) \]

Here \( P_y \) is the price of the output good, \( P_{K_j} \) is the price of capital of type \( j \), \( \delta_j \) is the depreciation rate of type \( j \) capital, \( \text{MPK}_j \) is the marginal physical product of type \( j \) capital, and \( \hat{P}_{K_j}(t) \) is the percentage rate of change of the price of type \( j \) capital. This is simply a rewriting of the Hall-Jorgenson rental price equation. Assuming the capitals are the same (hence dropping \( j \)'s), and by using the definition of the capital share, which is the share of income payments to capital:

\[ \alpha(t) = \frac{P_y(t)\text{MPK}(t)K(t)}{P_y(t)Y(t)} \]

And, the real rate of return to capital is calculated as:

\[ r(t) = i(t) - \hat{P}_y(t) = \frac{\alpha(t)}{P_{K}(t)K(t)/P_y(t)Y(t)} + \left[ \hat{P}_{K}(t) - \hat{P}_y(t) \right] - \delta(t) \]

Here \( P_{K}(t)K(t) \) is the nominal value of the aggregate capital stock, and \( \hat{P}_{K} \) is the average growth rate of the price of capital, \( Y \) is the output, and \( \alpha(t) \) is a share of payments to capital. To replace the unobservable \( \text{MPK} \) in \( \alpha(t) \) we use the alternative definition as one minus labor share:

\[ \alpha(t) = 1 - \frac{W(t)L(t)}{P_y(t)Y(t)}, \]

where \( W \) is an average wage and \( L \) is total employment. Therefore, the formula can be rewritten:

\[ r(t) = i(t) - \hat{P}_y(t) = \frac{1 - \frac{W(t)L(t)}{P_y(t)Y(t)}}{P_{K}(t)K(t)/P_y(t)Y(t)} + \left[ \hat{P}_{K}(t) - \hat{P}_y(t) \right] - \delta(t) \]

(1)

We estimate the real return to capital in Turkey on the aggregate level and in construction sector using (1) and the following variables:

- Output level, \( Y \)
- Capital stock, \( K \)
- Price of output, \( P_y \)
- Price of capital good, \( P_K \)
- Wages, \( W \) (as a share of GDP), or equivalently the labor share
- Depreciation rate of capital, \( \delta \)
Data

Output: Aggregate and industry-level real GDP series are taken from the national account data in TurkStat. 77

Capital stock: We use standard perpetual inventory approach to construct the series of capital stock, which requires long investment series to access gross fixed capital formation. For aggregate capital stock, we use long aggregate investment series available from 1963 in the Turkish Statistical Institute. The capital stock $K_t$ is developed from the perpetual inventory method using the data on real investment:

$$K_t = (1 - \delta)K_{t-1} + I_t$$

where $\delta$ is the depreciation rate of physical capital and $I_t$ is real investment. Gross capital stock is calculated as the sum of gross fixed capital formation in previous years, of which the service live is not yet expired. The method for calculating the aggregated capital stock is based on data for the period 1963-2015. We initialize the capital stock in 1963 as the ratio of investment in to the sum of the average geometric growth rate of real investment in the country over the period from 1963 to 1973 and the depreciation rate of capital:

$$K_{1963} = \frac{I_{1963}}{\delta + \hat{g}}$$

For capital stock in the construction sector, we first estimate long investment series going back to 1963 assuming a constant sector investment share in total investment. The data on total investment in the construction sector is derived from the firm-level survey data from Annual Industry and Service Statistics (AISS) and represents total investment in tangible goods including investment in land, existing buildings and structures, construction and alteration of buildings, machinery and equipment, and investment in other tangible goods. The data is available only for the 2003-12 period, which is insufficient and would lead to vastly underestimated capital stock and overestimated rate of return to capital. In addition, AISS does not cover agriculture and statistics could be underreported. To avoid misrepresentation of construction investment share, we apply the share in total investment from AISS to aggregate gross fixed investment from national account for corresponding sectors and construct longer construction investment series to account to accumulation of gross capital stock over time. We assume that the construction investment share from AISS is constant over time and equal to the average share during the 2003-12 period, with the exception of that period where the actual shares are available. Capital stock in the construction sector is developed using the same methodology as in the case of the aggregate capital stock.

Depreciation: We assume a constant average depreciation rate of 3.6 percent for about 30 years of the investment life for all sectors and the construction sector in particular over time, as defined by OECD (1998), International Sectoral Database (ISDB) User’s Guide. Other assumptions could be made.

77 The current industry data is categorized by National Association of Corrosion Engineer (NACE) codes: http://www.turkstat.gov.tr/PreTablo.do?alt_id=1035
**Output deflator:** Aggregate and industry deflators are calculated using real and current output data from TurkStat.

**Deflator of capital goods:** Price of investment normally includes the price of structures/buildings and the price of machinery and equipment. We use the domestic producer price index for capital goods available from TurkStat to proxy for the price of investment goods.

**Share of capital:** We calculate capital share as one minus labor income share, which is a share of total wages and salaries in output. For all sectors, we use total compensation of employees and GDP from national accounts in TurkStat. The data on total labor compensation is available for 1987-2006 and, for the remaining years, we employ the average share of compensation in total GDP of the period the data is available. The labor share in construction sector is calculated using wages and salaries and value added statistics from firm-level surveys from AISS. The data is available for the 2003-2012 period. For the remaining years, we assumed the moving average labor share using the past two years.

**Time span:** Rates of return to capital for all sectors are calculated for 1998-2014. Although the real investment, production, capital stock data starts in 1960s, the measures used in the empirical analysis are from 1998, the first year for which producer price index for capital goods is available. The analysis is done through 2014, the year for which last data inputs on investment and capital stock are available. Calculations for construction sector are done from 2003, the first year the wage statistics is available, which is used to calculate labor share.
ANNEX 2: ANALYSIS OF EFFECTS AND DETERMINANTS OF FDI

Firm-level analysis of FDI impacts

1. Data is from the ORBIS database (also known as AMADEUS for European countries) which is compiled by Bureau van Dijk Electronic Publishing (BvD). It covers 60 countries worldwide, including both developed and emerging countries. ORBIS has financial accounting information from detailed harmonized balance sheets and profit and loss accounts of all companies. In terms of coverage, the database is crucially different from the other data sets that are commonly used in the literature, such as Compustat (for the United States), Compustat Global, and Worldscope databases, in that 99 percent of the companies in ORBIS are private, whereas the data sets mentioned contain information mainly on large listed companies. A fundamental advantage of our data is the detailed ownership information, encompassing over 30 million “links” between companies and their shareholders. For each target/affiliate/subsidiary company we know the amount of foreign investment in company stock, together with the country of origin of the investor. We have 7000+ unique firms over the period 2005 to 2012, amounting to 35,000+ observations. FDI represents 3 to 4 percent of these firms receiving foreign investment, which is a typical average number in Europe (much higher in Latin American countries). The econometric analysis is based on the work by Fons-Rosen, Kalemli-Ozcan, Sorensen, Volosovych, and Villegas-Sanchez (2014).

2. Econometric estimates using firm-level data show that the key parameters foreign investors look for when selecting a specific firm are whether the firm’s sector is growing and whether the firm is productive and growing. All other determinants are insignificant, such as size, age, capital intensity or being in a certain sector. This is the result of a probit regression to understand which domestic firms receive foreign investment in the first place, i.e., firm-level determinants of foreign investment. This is presented in the following equation:

\[ FO_{it} = \beta_0 FO_{i,t-1} + \beta_1 \log(K/L)_{i,t-1} + \beta_2 \log(VA/L)_{i,t-1} + \beta_3 \log(ASSETS)_{i,t-1} + \beta_4 \log(ASSETS)_{i,t-1} + \beta_5 AGE_{i,t} + \beta_6 AGE^2_{i,t} + \theta + \epsilon_{it} \]  

(1)

Where \( i \) represents each firm, and \( t \) the time.

3. To measure firm productivity, we both use \( \log(VA/L)_{i,t-1} \), and \( \log(TFP)_{i,t-1} \). The data also shows that multinational subsidiaries generally outperform domestic firms and the most prevalent form of multinational entry is through acquisition, rather than Greenfield investment. It is important to take this selection process into account because it signifies that a positive correlation between FDI and productivity can be either due to the fact that foreign firms pick productive firms, or because the arrival of foreign capital increases the productivity of the subsidiary once it receives the investment. In the following sections, our analysis therefore is based on dynamic lagged difference regressions to distinguish the impact of FDI on productivity from this ‘cherry picking’ of dynamic firms by the foreign investors.

4. Studies on FDI spillovers in emerging markets (horizontal and vertical) typically rely on a two-digit industry classification (see, for instance, Javorcik, 2004). We argue that the two-digit classification is too aggregated to properly identify spillovers and mask important
heterogeneity at finer sector classifications. Following Fons-Rosen et al. (2014), we define horizontal “competition spillovers” at the four-digit classification for each country:

\[
\text{Spillover Comps}_{s4,t} = \frac{\sum_{i\in s4} F_{i,t} Y_{i,t}}{\sum_{i\in s4} Y_{i,t}}, \tag{3}
\]

where \( s4 \) refers to the four-digit sector classification. We construct the variable for “knowledge spillovers:”

\[
\text{Spillover Know}_{s4,t} = \text{Spillover}_{s2,t} - \frac{\sum_{i\in s4} F_{i,t} Y_{i,t}}{\sum_{i\in s2} Y_{i,t}}, \tag{4}
\]

**Table A.1: Foreign Ownership and Firm Productivity**

<table>
<thead>
<tr>
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<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
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<tbody>
<tr>
<td>( \Delta \ln(\text{TFP}) )</td>
<td>0.000</td>
<td>0.001</td>
<td>0.002</td>
<td>0.011***</td>
<td>0.011***</td>
</tr>
<tr>
<td>( \Delta^2 \ln(\text{FO}) )</td>
<td>(0.003)</td>
<td>(0.003)</td>
<td>(0.003)</td>
<td>(0.003)</td>
<td>(0.003)</td>
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<tr>
<td>( \Delta^3 \ln(\text{FO}) )</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \Delta^4 \ln(\text{FO}) )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Observations     | 34,128 | 32,231 | 28,344 | 18,138 | 18,138 |
| Year Fixed Effects | Yes    | yes    | yes    | yes    | yes    |
| Sector Fixed effect | Yes    | yes    | yes    | yes    | yes    |
| Sector-Year Fixed effect | No     | no     | no     | no     | yes    |

**Notes:** The regressions are estimated by Generalized Least Squares (GLS). TFP is total factor productivity, computed using the Wooldridge-Levinsohn-Petrin methodology (WLP). FO is transformed as \((\text{FO} / 100) + 1\). FO is the share of foreign-owned equity. \( \Delta^4 \) indicates the change between year \( t \) and year \( t - k \) where \( k = 1, ..., 4 \). Standard errors clustered at the firm level are in parenthesis. ***, **, *, denote significance at 1%, 5%, and 10% levels.
Table A.2: Foreign ownership and firm employment

<table>
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<tr>
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<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
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<tbody>
<tr>
<td>Δln(FO)</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Δ²ln(FO)</td>
<td></td>
<td>0.353***</td>
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<td>Δ³ln(FO)</td>
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<td></td>
<td>0.585*</td>
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</tr>
<tr>
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<td></td>
<td></td>
<td>-0.293***</td>
<td>-0.123***</td>
</tr>
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<td>Observations</td>
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<td>32,231</td>
<td>28,344</td>
<td>18,138</td>
<td>18,138</td>
</tr>
<tr>
<td>Year Fixed Effects</td>
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<td>yes</td>
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<td>yes</td>
<td>yes</td>
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<tr>
<td>Sector Fixed effect</td>
<td>Yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
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<tr>
<td>Sector-Year Fixed effect</td>
<td>No</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
</tbody>
</table>

Notes: The regressions are estimated by GLS. LHS is log employment. FO is transformed as (FO/100)+1. FO is the share of foreign-owned equity. Δ³ indicates the change between year t and year t − k where k = 1,...,4. Standard errors clustered at the firm level are in parenthesis. ***, **, *, denote significance at 1%, 5%, and 10% levels.

Table A.3: Competition and Spillovers Within and Between Four Digit Sectors

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spillover Competition</td>
<td>-0.077***</td>
<td>-0.015***</td>
<td>-0.057***</td>
<td>-0.018***</td>
</tr>
<tr>
<td></td>
<td>(0.005)</td>
<td>(0.004)</td>
<td>(0.005)</td>
<td>(0.005)</td>
</tr>
<tr>
<td>Spillover Knowledge</td>
<td>0.346***</td>
<td>0.225***</td>
<td>0.329***</td>
<td>0.119**</td>
</tr>
<tr>
<td></td>
<td>(0.032)</td>
<td>(0.006)</td>
<td>(0.008)</td>
<td>(0.009)</td>
</tr>
<tr>
<td>Observations</td>
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<td>16,192</td>
<td>16,492</td>
</tr>
<tr>
<td>Firm Fixed Effects</td>
<td>yes</td>
<td>yes</td>
<td>Yes</td>
<td>yes</td>
</tr>
<tr>
<td>Sector2dig-Year Fixed Effects</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
</tbody>
</table>

Notes: Estimation performed by GLS where weights are the square root of the firm mean squared predicted residuals. Standard errors clustered at the corresponding level specified in the table are reported in parentheses. Results are obtained based on the sample of firms with no foreign ownership (i.e., firms that were never acquired (in any percentage) by a foreign-owned investor over the period of analysis). The dependent variable is the log of total factor productivity which is computed following WLP. See the text for the information on the construction of spillover variables.

Cross-country analysis of FDI determinants

5. The literature on FDI presents different frameworks to explain a multinational’s decision to invest, and we included a list of variables from these frameworks in our cross-country regressions. According to the Ownership-Location-Internalization (OLI) paradigm, firm-specific determinants, labor endowments and location-bound factors play important roles. In addition, the Knowledge-Capital Model allows for multiple production facilities, separating cross-support centralized services and dispersed production that is observed in some multinationals. This approach distinguishes three types of FDI depending on the motivation: export-oriented (vertical),

78 Dunning, 1998.
market seeking (horizontal), and resource seeking. We combine these approaches in an eclectic model of the investment decision that includes a number of determinants: 1) enrollment in tertiary education as proxies for human capital expected to attract companies requiring a skilled labor force; 2) telephone lines per capita lowering costs and improving business competitiveness; 3) GDP per capita growth as proxy for market expansion and horizontal FDI inflows attraction, 4) the level of trade openness, which signals good conditions for exporting firms; 5) other macroeconomic and country risk variables, such as inflation, a typical proxy for macroeconomic stability, an exchange rate stability index, an economic risk rating and a financial risk rating are also included as potential determinants of FDI, following the empirical literature; 6) institutions are widely considered to matter for FDI and we include control of corruption, rule of law, government stability, bureaucracy quality, and investment profile. It would be expected that the higher a country rates in these institutional dimensions, the larger FDI inflows that country would be receiving; 7) Given the nature of our sample – mostly composed of Eastern European countries during the post-communist era- it is important to transition indexes elaborated by the European Bank for Reconstruction and Development (EBRD), including price liberalization, competition policy, and privatization; 8) The impact of regional integration is modeled with two dummy variables, for accession negotiations with the EU and EU membership, respectively.

6. The econometric specification takes as dependent variable yearly FDI inflows as a percentage of GDP \( y_{it} \), which is a function of location-related, macroeconomic, institutional, and transition-related determinants \( x_{it} \), and country fixed effects \( v_i \) as well as the error term \( u_{it} \).

\[
y_{it} = \beta_0 + \beta_1 x_{it} + v_i + u_{it}
\]

Cross-country regression is based on a sample of 16 countries from Eastern and Central Europe including Turkey, over the period 1999-2013. The panel is fairly balanced, despite the lack of data for the EBRD transition index for the Czech Republic, and the unavailability of data for the same index in 2013 resulting in the loss of about 30 observations.

79 Markusen and Maskus, 1999.
80 Buch and Lipponer, 2004; Asiedu, 2002.
Table A.4: Cross-country Analysis of Determinants of FDI, Model Specifications 1-9

| Source: Kalemli-Ozcan, Sanchez-Martin, and Thirion (forthcoming). *** , **, * denote significance at 1%, 5%, and 10% levels. Note: Columns show regressions using models starting with the simplest model with only macroeconomic parameters (column 1), to which country risk parameters (column 2), education and infrastructure (column 3), the economic transition process (4). Specifications (5) to (8) follow a similar logic, but with institutional parameters instead of macroeconomic indicators. |
Table A.5: Cross-country Analysis of Determinants of FDI, Model Specifications 10-18

<table>
<thead>
<tr>
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<tr>
<td>GDP Growth</td>
<td>14.72*</td>
<td>11.76*</td>
<td>15.72*</td>
<td>16.25**</td>
<td>14.19*</td>
<td>16.43*</td>
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<td></td>
<td>(8.161)</td>
<td>(7.550)</td>
<td>(8.841)</td>
<td>(7.041)</td>
<td>(7.090)</td>
<td>(7.776)</td>
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<tr>
<td>Δ Trade</td>
<td>3.874</td>
<td>4.358*</td>
<td>4.156</td>
<td>3.996</td>
<td>4.316*</td>
<td>4.462</td>
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<td></td>
<td>(2.399)</td>
<td>(2.476)</td>
<td>(2.585)</td>
<td>(2.335)</td>
<td>(2.428)</td>
<td>(2.561)</td>
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<td>Δ Enrolled in</td>
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<td>0.0520</td>
<td>0.0315</td>
<td>0.0210</td>
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<tr>
<td>tertiary ed.</td>
<td>(0.0785)</td>
<td>(0.0777)</td>
<td>(0.0770)</td>
<td>(0.0878)</td>
<td>(0.0897)</td>
<td>(0.106)</td>
</tr>
<tr>
<td>Δ Fixed &amp; mobile</td>
<td>0.125**</td>
<td>0.124**</td>
<td>0.0994*</td>
<td>0.133**</td>
<td>0.131**</td>
<td>0.106**</td>
</tr>
<tr>
<td>lines</td>
<td>(0.0470)</td>
<td>(0.0460)</td>
<td>(0.0492)</td>
<td>(0.0475)</td>
<td>(0.0470)</td>
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<td>Law and order</td>
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<td>2.539***</td>
<td>2.409**</td>
<td>2.374**</td>
<td>2.499**</td>
<td>2.504**</td>
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<tr>
<td></td>
<td>(0.812)</td>
<td>(0.856)</td>
<td>(0.894)</td>
<td>(1.020)</td>
<td>(1.040)</td>
<td>(1.080)</td>
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<td>Exchange rate</td>
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<td>0.233*</td>
<td>0.142</td>
<td>0.221</td>
<td>0.186</td>
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<td>(0.108)</td>
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<td>(0.124)</td>
<td>(0.136)</td>
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<td>Large scale</td>
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<td>privatization</td>
<td>(1.348)</td>
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<td>(1.500)</td>
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<td>EU accession</td>
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<td>2.124**</td>
<td>1.799***</td>
<td>2.326**</td>
<td>2.124**</td>
<td>1.799***</td>
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<td>(0.921)</td>
<td>(0.587)</td>
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<td>(0.921)</td>
<td>(0.587)</td>
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<td>EU member</td>
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<td>0.382</td>
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<tr>
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<td>(1.650)</td>
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<td>Constant</td>
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<td>-18.8**</td>
<td>-8.912*</td>
<td>-10.46*</td>
<td>-17.39**</td>
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<td></td>
<td>(3.677)</td>
<td>(4.381)</td>
<td>(7.327)</td>
<td>(5.064)</td>
<td>(5.425)</td>
<td>(7.199)</td>
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<td>183</td>
<td>214</td>
<td>214</td>
<td>183</td>
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<tr>
<td>R-squared</td>
<td>0.247</td>
<td>0.254</td>
<td>0.253</td>
<td>0.266</td>
<td>0.269</td>
<td>0.260</td>
</tr>
<tr>
<td>Number of countries</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>15</td>
</tr>
</tbody>
</table>

Source: Kalemli-Ozcan, Sanchez-Martin, and Thirion (forthcoming). ***, **, *, denote significance at 1%, 5%, and 10% levels.

Note: Columns show regressions using models with country fixed effects, EU dummies, and time fixed effects.

7. It is worth noting a strong increase of the R squared when the number of mobile phone and fixed lines subscriptions, proxy for telecommunications infrastructure, is included in the regressions. It could be argued that there could be “endogeneity” associated to this variable, especially considering that Turkey has experienced large FDI inflows into this sector since 2005. However, this proxy variable is not directly associated to the amount of FDI in communications (coming to Turkey to buy the physical and intangible assets). Second, mobile and fixed phone subscriptions in Turkey have grown steadily from 1999 through 2008; thus, the process had already begun before the 2005-2008 FDI boom. Third, it is worth considering that Turkey is only one of the 16 countries of the sample. Furthermore, in order to ensure that results are robust, and do not suffer from major simultaneity problems, we have performed alternative Generalized Method of Moments estimation following Arellano and Bond (1991), which render very similar results to those presented in our original econometric specification. Lastly, dropping the infrastructure proxy does not qualitatively affect the results either.
Skills and FDI Estimation Methodology

Gravity Equations of FDI

8. Multinational firms can fragment their production processes into stages and locate activities according to international differences in factor prices, when stages of production are characterized by different factor intensities. We assume two countries with consumers that have identical and homothetic preferences. There are two competitive sectors, $A$ and $MZ$, each producing a homogeneous good. Good $A$ is freely traded between the two countries. The technology of sector $A$ can be characterized by the unit cost function $c(w_i, v_j) = c(w_j, v_j) = 1$, where the subscripts $i$ and $j$ indicate the home and the foreign country, respectively; $w$ denotes the wage, the factor price of low-skilled labor $L$; $v$ the salary; and the factor price of high-skilled labor $S$.

9. Production of good $M$ requires the use of an intermediate good $Z$. Production of both goods, $M$ and $Z$, uses the two factors, low-skilled and high-skilled labor, in fixed proportions. Sector $MZ$ can be either integrated, when both good $M$ and $Z$ are produced within the same country, or geographically fragmented, when $M$ and $Z$ are produced in different countries. Fragmented production benefits from each country’s comparative advantage. The unit cost functions are given by

$$BZ_i = \ell w_i + (1-\ell) v_i, \quad BZ_j = \ell w_j + (1-\ell) v_j,$$

$$BM_i = \phi w_i + (1-\phi) v_i + \delta p_z, \quad BM_j = \phi w_j + (1-\phi) v_j + \delta p_z,$$

where the coefficients $\ell$ and $\phi$ are fixed factor inputs per unit output. $\delta$ is the input of the intermediate good $Z$, in the production of final good $M$. The prices $pz_{ij}$ are the minimum costs of supply of the intermediate good $Z$ in both countries. Thus, $pz_{ij}$ is min ($bz_i, tz_{ij}bz_i$) and $pz_j$ = min ($bz_j, tz_{ij}bz_i$) where $tz_{ij}$ is the ad valorem distance cost and $bz_{ij}$ are business costs including trade costs, information costs, transport costs, institutional and infrastructure barriers.

10. The countries have fixed endowments of both factors. The home country $i$ is the high-skilled labor-rich country. If distance costs $tz_{ij}$ are high, production of $MZ$ is integrated. Each country specializes in the production of the good, $A$ or $MZ$, in which it has a comparative advantage. Fragmentation is profitable, in contrast, if the costs of shipping the intermediate good $Z$ are low. It is assumed that the production of $Z$ is low-skilled labor-intensive relative to the production of $M$, $\ell<\phi$. The firms from country $i$ in sector $MZ$ have an incentive to relocate the low-skilled labor-intensive stage $Z$ to the foreign country $j$ and specialize in the high-skilled labor-intensive stage $M$ at home. If distance costs are low enough, production of $MZ$ is completely fragmented in an $M$-stage carried out in the home country $i$ and a $Z$-stage produced in the host country $j$. Good $A$ is produced in both countries, although with different factor intensities in $i$ and $j$.

82 Kleinert and Toubal (2010)
83 (Helpman, 1984; Hanson et al., 2005.)
11. Between these two full-specialization equilibria, there exists a range of distance costs where integrated and fragmented production coexist. In equilibrium, the prevailing production structure includes both integrated and fragmented firms.

12. Let $\theta$ be the share of $Z$ production taking place in foreign affiliates in the host country $j$. $\theta$ is determined by the factor–price ratios ($w/v)_i$ at home and ($w/v)_j$ abroad and the distance costs $\tau_{zi}$. The factor–price ratios and the distance costs must combine to yield the same price in $i$ for intermediate goods produced at home and in the foreign country ($pz_i = bz_i = \tau_{zi}bz_i$). For the whole range of distance cost levels where integrated and fragmented production coexist, the share of fragmented production $\theta$ increases with falling distance costs $\tau_{zi}$ ($\frac{\partial\theta}{\partial\tau_{zi}}$). The share of fragmented production $\theta$ is also affected by the relative factor endowment of the two countries, $Si/(Si + Sj)$ and $Li/(Li + Lj)$, and by the size of the two countries.

13. Production of the intermediate good $Z$ in country $j$ results from the fragmentation of production in sector $MZ$. Production of $Z$ can be seen as foreign affiliate output. Production of the intermediate good $Z$ matches foreign affiliates’ sales $AS_{ij}$ of firms from $i$ in $j$ with $AS_{ij} = \delta(1-\mu)Y\theta$. Affiliates’ production depends on the share $1-\mu$ of total income $Y$ spent in both countries on the final good $M$, on the fraction $\delta$ of intermediates good $Z$ that is necessary to produce good $M$, and on $\theta$, the fraction of intermediate goods produced in country $j$.

14. Since $\theta$ is a negative function of distance costs $\tau_{zi}$, production of foreign affiliates decreases in distance costs. In addition, $\theta$ is also positively affected by the relative factor endowments ratio.

$$\frac{(Si/(Si + Sj) / (L_i/(L_i/L_j))$$

and negatively by the income ratio $Y_i / Y_j$ between the two countries. We assume that the effects on $\theta$ can be separated in a function of distance costs $f(\tau_{zi})$, a function of relative factor endowment ratio $g_i(S_i/(S_i + S_j) / (L_i/(L_i/L_j))$ and a function of the income ratio $g_2(Y_i / Y_j)$. Concerning the relative size effect $g_2(Y_j / Y_i)$, note that a large host country $j$ affects the share $\theta$ of affiliate production positively, whereas a large home country affects $\theta$ negatively. The supply effect of the home country $i$ affects affiliates’ production negatively in the factor-proportions model. Assuming that functions $f$, $g_1$, and $g_2$ are separable, affiliate sales (FDI) can be restated as follows:

$$\text{FDI}_{ij} = \delta(1-\mu) (Y_i + Y_j) g_2 (Y_j + Y_i) f (\tau_{zi}, bz_{ij}) g_i (S_i/(S_i + S_j) / (L_i/(L_i/L_j)) (3)$$

15. Linearizing equation (11) and assuming that distance costs $\tau_{zi}$ are a function of distance $D_{ij}$, we derive a gravity equation, which is augmented by the relative factor endowments ratio, business costs, $bz_{ij}$ such as institutions and infrastructure barriers as well as trade and investment costs, and the sum of income in both countries:

$$\ln(\text{FDI}_{ij}) = \beta_0 + \beta_1 \ln(Y_i + Y_j) + \beta_2 \ln(\text{RFE}_{ij}) + \beta_3 \ln(\text{DIST}_{ij}) + \beta_4 \ln(bz_{ij}) (4)$$

16. In the above equation $\ln(Y_i + Y_j)$ is the log of the sum of GDP of the parent and the host country. $\ln(\text{RFE}_{ij})$ is the log of relative skill endowments between the parent and the host, $\ln(\text{DIST}_{ij})$ is the log of distance between the capital cities of the two countries and $\ln(bz_{ij})$ is the log of business costs including transaction costs, trade costs, investment costs, infrastructure and institutional barriers.
Immigration and FDI

17. Modifying De Simone and Manchin (2012) information costs \( I_{ij} \) which is a part of business costs in the above equation are structured as a negative function of the stock of emigrants from country \( j \) in country \( i \) \( (\text{migstock}_{ji}) \) and the level of past FDI from country \( i \) in country \( j \) \( (\text{FDI}_{ijt-1}) \):

\[
I_i = (1 + \text{migstock}_{ji})^\beta
\]

18. Migrants take part in business networks and convey information on the characteristics of the home country labor force, with an overall favorable impact on risk and transaction-cost of cross-border investment. Thus, immigrants could play an important role in encouraging the FDI from the migrant receiving countries to the migrant source countries. Combining equations (4) and (5) and through rearranging the gravity equation can be rewritten as

\[
\ln(\text{FDI}_{ij}) = \beta_0 + \beta_1 \ln(Y_i + Y_j) + \beta_2 \ln(\text{RFE}_{ij}) + \beta_3 \ln(\text{DIST}_{ij}) + \beta_4 \ln(\text{obz}_{ij}) + \beta_5 \ln(\text{MIGSTOCK}_{ij}) + \beta_6 \ln(\text{FDI}_{ijt-1})
\]

19. In the above model, countries have different levels of skilled endowments where the MNEs locate skilled activities in the parent country and labor seeking activities in the host countries and the impact of relative skill and future skill (university enrollments) endowments on FDI is positive. However, if the endowments gaps decrease due to economic development of the home country, as in the case of Singapore (Chellaraj et al., 2013), and over time the motivation changes from vertical to horizontal. The impact on FDI will be negative with FDI being located in a country which has higher relative skills. The RFE can be divided into three categories, relative skills, relative stock of skilled migrants and relative future skills.

Methodology

20. Studies on skilled migration generally do not take into consideration domestic skills.84 Meanwhile, the studies on the impact of skills on FDI generally assume no movement of labor between countries.85 Chellaraj et al. (2008) separately included both total skills (domestic plus foreign) and skilled migrants simultaneously as a proportion of labor force in the US economy but focused on its impact on patenting. In the gravity models discussed below we incorporate both skill endowments and skilled migrants as a proportion of labor force to study its impact on FDI for both developing and industrialized countries.

A Gravity Model of FDI and Migration from MNEs based in Industrialized Countries with Turkish Diaspora to Turkey

The impact of Turkish migrants on FDI in Turkey by MNEs located in Turkish migrant receiving countries such as Germany and the United States is specified as follows

\[
\ln(\text{FDI}_{ijt}) = \beta_0 + \beta_1 \ln(\text{GDP}_i + \text{GDP}_j) + \beta_2 \ln(\text{SK}_{ijt} / \text{SK}_{jt}) + \beta_3 \ln(\text{FSK}_{ijt} / \text{FSK}_{jt}) + \beta_4 \ln(\text{IM}_{jt}) + \beta_5 \text{IC}_{jt} + \beta_6 \text{INFRAC}_{jt} + \beta_7 \text{INST}_{jt} + \beta_8 \ln(\text{Tax}_{ij}) + \beta_9 \ln(\text{Tax}_{it}) + \beta_{10} \ln(\text{DIST}_{ij}) + \epsilon_{ijt}
\]

84 Wagoner et al., 2002; Rauch and Trinidad, 2002; Head and Reis, 1998.
21. In this specification the dependent variable is the log of the stock of FDI invested by country i (the parent) in country j (the host). For inward investment, the country concerned is always the host country and for outward investment it is always the parent country. CMM (2001) employed majority-owned affiliate sales in manufacturing as their measure of FDI activity. Data on affiliate sales are not available for most countries and hence we propose to use FDI stocks as the dependent variable. The model identifies the determinants of real FDI stocks. The first right-hand side variable is the log of the sum of parent country and host country real gross domestic product, which we label ln(GDP_{it} + GDP_{jt}). It captures joint market size and the coefficient is expected to be positive.

22. The relative skill endowment, ln (SK_{it} / SK_{jt}), defined as the log of skilled labor as a proportion of labor force in parent countries divided by the corresponding figure in host countries, is a central variable for its potential to identify differences in investment motivations. Thus, if the parent country is skill-abundant and the recipient country is abundant in lower-skilled labor, an increase in the proportion of skilled labor in the parent relative to the host should raise incentives for vertical FDI, or fragmentation, implying a positive coefficient. However, if countries are relatively similar in their endowments, supporting horizontal incentives for FDI, an increase in the proportion would tend to diminish investment, generating a negative coefficient.

23. The impact of changes in the relative future skills, ln (FSK_{it} / FSK_{jt}) defined as the log of future skilled labor as a proportion of labor force in parent countries divided by the corresponding figure in host countries, is hypothesized to be similar to that of the existing skills. If the parent country is future skill-abundant (higher levels of university and technical school enrollments) relative to the host country, an increase in the future skill differences should raise incentives for vertical FDI, implying a positive coefficient. However, if countries are relatively similar in their future skill endowments, supporting horizontal incentives for FDI, an increase in the parent country future skill abundance would tend to diminish investment, generating a negative coefficient.

24. Ln(IM_{ji}) is defined as the log of the stock of migrants in migrant receiving industrialized country i, from developing country j. It is hypothesized that as the stock migrants from country j in country i increases, MNEs headquartered in country i will invest more in country j (network effect). This will be estimated separately for both the log of all migrant stocks and the log of all skilled migrant stocks. Thus as Turkish skilled migrant stocks increased in the US, MNEs headquartered in the US, such as Intel or Microsoft will increase their investment in Turkey taking advantage of the Turkish skilled migrant networks available in the US. Thus, increasing skilled migrants in the US from Turkey is also likely to increase FDI from the former to the latter.

25. The variable IC_{jt} captures the costs of investing in the host country. Higher host-country investment costs should reduce investment. The variable INFRA_{jt} captures the infrastructure costs or bottlenecks which are impediments to investing in the host country. Higher host-country infrastructure bottlenecks should reduce investment. The variable INST_{jt} accounts for institutional costs or constraints which are roadblocks to investment in the host country. Higher host-country institutional constraints should also reduce investment. ln(Tax_{jt}) is the log of corporate taxes in the host country. Higher the host country corporate taxes, lower the investment in the host country and

86 The definitions of variables and data sources are provided in section 5.
hence this is expected to have a negative relationship. $\ln(\text{Tax}_{it})$ is the corporate tax rate in the parent country. Higher the parent country corporate tax rates, higher the investment abroad and hence this is expected to have a positive relationship. Finally, $\ln(\text{DIST}_{ij})$ is the log of distance, in kilometers between the capital cities of partner countries.

A Gravity Model of FDI and Migration from Migrant Scarce Industrialized Countries to Migrant Abundant Industrialized Countries

26. The model for FDI from migrant scarce to migrant abundant countries is specified as follows:

$$\ln(\text{FDI}_{ijt}) = \beta_0 + \beta_1 \ln(\text{GDP}_{it} + \text{GDP}_{jt}) + \beta_2 \ln (\text{SK}_{it} / \text{SK}_{jt}) + \beta_3 \ln (\text{FSK}_{it} / \text{FSK}_{jt}) + \beta_4 \ln(\text{SKIM}_{it} / \text{SKIM}_{jt}) + \beta_5 \text{IC}_{jt} + \beta_6 \text{INFRA}_{C_{jt}} + \beta_7 \text{INST}_{jt} + \beta_8 \ln(\text{Tax}_{jt}) + \beta_9 \ln(\text{Tax}_{it}) + \beta_{10} \ln(\text{DIST}_{ij}) + \epsilon_{ijt}$$  (2)

27. The impact of skilled migrant stock ratio $\ln(\text{SKIM}_{it} / \text{SKIM}_{jt})$, defined as the log of skilled migrants as a proportion of labor force in parent countries divided by the corresponding proportion in host countries, on FDI is hypothesized to be negative. Usually, countries well-endowed with skilled migrants are well developed and industrialized and are similar in endowments, supporting horizontal incentives with regards to skilled migrants. Furthermore, the migrant networks present in skilled migrant abundant industrialized countries gives these countries a significant competitive advantage with regard to attracting FDI. Thus, as Turkey becomes relatively more abundant in skilled migrants relative to industrialized countries, the latter are expected to invest more in the former. All other variables are expected to have the same relationship with FDI as in the model discussed in section 4a.

Data

28. A panel dataset for thirteen years (2000-2012) is used in the analysis. Bilateral FDI data are from the World Investment Directory (WID) (2000-2010) published by UNCTAD and the OECD database (2011-2012). The GDP data (in USD) are from the World Development Indicators (WDI). Data for the right hand side variables in sections 3a and 3b for a number of countries come from Chellaraj et al. (2015; 2014; 2013) and Chellaraj and Mattoo (2015) updated through 2013. For others they were calculated using the definitions discussed in this section. Skilled labor abundance is defined as the proportion of the labor force with tertiary (college or university) education. These figures are compiled from the various statistical and labor force yearbooks for individual developing countries and from the WDI of the World Bank. In cases where some annual figures were missing, the skilled-labor ratios were taken to equal the period averages for each country. Statistics on university and polytechnic enrollments are available from the United Nations Educational, Scientific and Cultural Organization (UNESCO) Statistical Yearbooks. They are defined as the number of students enrolled at the university and polytechnic levels including graduate students as a proportion of labor force.

29. The cost of investing in the affiliate country is a simple average of several indices of perceived impediment to investment, reported in the Global Competitiveness Report (1995-2014) of the World Economic Forum. The investment barriers include restrictions on the ability to acquire control in a domestic company, limitations on the ability to employ foreign skilled labor, restraints on negotiating joint ventures, strict controls on hiring and firing practices, market dominance by a small number of enterprises, an absence of fair administration of justice,
difficulties in acquiring local bank credit, restrictions on access to local and foreign capital markets, and inadequate protection of intellectual property. The resulting indices are computed on a scale from 0 to 100, with a higher number indicating higher investment costs. The infrastructure bottlenecks and institutional constraints in the affiliate country is a simple average of several indices of perceived impediment to infrastructure and perceived institutional constraints, also reported in the Global Competitiveness Report (1995-2014) of the World Economic Forum. The infrastructure bottlenecks include sparse road and railroad networks, the inability of air and water transport (ports, harbors and inland waterways) to meet business requirements, poor energy infrastructure, low levels of investment in telecommunication and low levels of internet usage. The institutional constraints include lack of transparency, lack of exchange rate stability, high levels of bribery and corruption in the political system, poor legal and regulatory framework (extent of corruption in the legal system, civil or criminal), lack of judicial independence (due to politicized (as well as elected) law enforcement and unqualified judiciary) (Dove, 2016; Chellaraj, 2000; Tabarrok and Helland, 1999), widespread gender and ethnic discrimination and high prevalence of unethical practices. As in the case of the investment costs, the resulting indices for both infrastructure and institutions will be computed on a scale from 0 to 100, with a higher number indicating higher infrastructure bottlenecks and institutional constraints. It should be noted that both the investment costs as well as infrastructure and institutional constraints are ordinal and qualitative in nature, without “natural units”. Thus, regression coefficients represent the partial effects of a change in the average perceived costs of investing and trading as well as institutional and infrastructure constraints.

30. The corporate tax rates for each country (2000-2012) are available from the Institute for International Finance. A measure of distance is also incorporated, which is simply the number of kilometers between each country’s capital cities and it is available from the Research and Expertise on the World Economy (CEPII) database. 88

31. Finally, data on Turkish migrants, both total and skilled migrants, in destination countries are available from a variety of sources. Data on work permits issued (skilled migration) into Turkey are available from the OECD and Bureau of Foreigners, Borders, and Asylum, Directorate of General Security, Ministry of Interior, Government of Turkey. 89 For the US they are available from the US Department of Homeland Security and the relevant immigration departments or agencies in other countries (A list of sources are provided in the Annex). The stock of skilled Turkish and total migrants will be used wherever data are available. However, where such data are not available, as in the case of three countries, the United States, Australia, and Turkey (for expats and other skilled migrants working in Turkey) the methodology followed by Chellaraj et al. (2008), which is the number of skilled migrants cumulated over the preceding six-year period divided by the labor force, will be used instead.

32. Data on instruments are available from a variety of sources. The data on social expenditures are available from the OECD database for industrialized countries and the WDI database for

87 In the US state of Mississippi one does not need a college degree to become a judge in the state courts. In states such as Texas, Louisiana and Alabama state level judges are elected through partisan means and judgements are frequently rendered based on which way the political wind is blowing (Chellaraj, 2000; Tabarrok and Helland, 1999).
developing countries. The fertility data are available from the World Health Organization (WHO) Annual Yearbook. The Turkish diaspora data are available from the same sources as skilled migrants.

33. The number of countries and years included for the impact of skilled immigration and skilled diaspora are lower than that of the analysis of total diaspora due to lack of data for a few countries. The estimation procedure is Two Stage Least Squares with instrumental variables. Year and country fixed effects, to control for unobserved influences on FDI stocks that vary over time or are characteristic of a particular investment partner country, are also included.

Endogeneity and Instrumental Variables

34. It is evident that causation may run both ways between relative skill and future skills, and skilled migrants, the primary determinants of interest, and FDI. For example, an increase in inbound FDI may raise the level of enrollments in the recipient country due to scholarships made available for university training. Thus, future skills, the relative enrollment variable is likely to be endogenous to investment in some degree. Hence, instruments that are plausibly correlated with relative skill and relative future skill levels and stock of skilled migrants, but not correlated with the regression error term are identified. These endogenous variables should be correlated with the instruments adopted, but should be exogenous to change in their bilateral FDI stocks. For relative skills the instruments identified include family size in the host country, fertility rates lagged twenty two years in the host country and a ten year average of social expenditures other than education expenditures in the host country, lagged ten years. Similarly, for relative future skill levels, these include family size in the host country, fertility rates lagged eighteen years in the host country and a ten-year average of social expenditures other than education lagged six years.

35. Prior longitudinal studies indicate that social expenditures through improving nutrition and health status, have a positive effect on educational enrollment of children and hence the acquisition of skills (Behrman, et al, 2014; Peters, et al., 2000). In turn, future enrollment rates rise in secondary and university education (Alderman, et al., 2009; Glewwe, et al., 2001). Note that we specifically exclude education expenditures from social spending because the direct impact on later human capital could correlate with the location decisions of MNEs. However, this is not likely to be the case regarding other social expenditures on health and nutrition, which have an indirect effect. Long-lagged fertility rates are likely correlated with later educational attainment, as noted by Becker, et al. (2009). For example, studies from poor countries indicate that higher fertility rates increase the likelihood of a family remaining in poverty, making it difficult to procure education for children (Black, et al., 2005; Rosenzweig and Schultz, 1987). However, lagged fertility presumably is exogenous with respect to current FDI-location decisions. For skilled and total migration and a variety of instruments similar to the ones used by Javorcik et al (2011) will be considered. These include fertility rates lagged twenty-five years in the migrant receiving

90 The countries in the total diaspora sample are Australia, Austria, Belgium, Canada, Denmark, Finland, France, UK, Germany, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland and the USA. The countries in the skilled diaspora sample are Australia, Austria, Canada, Denmark, Finland, UK, Germany, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Sweden, Switzerland and the USA. The countries in the relative skilled migrant sample are Australia, Canada, Denmark, UK, Germany, Ireland, Japan, the Netherlands, New Zealand, Switzerland and the USA.
country, and migrant diaspora from the migrant sending country in the migrant receiving country lagged thirty years.

36. The instrumental-variables procedure is to run the first-stage regressions of the relative skills, relative future skills and skilled migrants as a proportion of labor force (in the case of skilled emigrants from Turkey and FDI) and relative skills, relative future skills and relative skilled migrant levels (skilled immigrants in Turkey and FDI) on the instrumental variables for each sample and use the predicted values to estimate second-stage tobit regressions. The Sargan test\(^91\) will be used to determine if the instruments are appropriate. The F test for weak instruments will be used to determine if the instruments are strong or weak\(^92\).

<table>
<thead>
<tr>
<th>Regressors</th>
<th>Inbound FDI</th>
<th>Outbound FDI</th>
</tr>
</thead>
<tbody>
<tr>
<td>lnGDP Sum</td>
<td>1.71***</td>
<td>0.43</td>
</tr>
<tr>
<td></td>
<td>(3.98)</td>
<td>(0.53)</td>
</tr>
<tr>
<td>lnSKi/SKj</td>
<td>3.18***</td>
<td>-6.34**</td>
</tr>
<tr>
<td></td>
<td>(2.97)</td>
<td>(-2.10)</td>
</tr>
<tr>
<td>lnFSKi/FSKj</td>
<td>-2.13**</td>
<td>-2.55***</td>
</tr>
<tr>
<td></td>
<td>(-2.47)</td>
<td>(-3.14)</td>
</tr>
<tr>
<td>TurkeyPop/Host Pop</td>
<td>0.29***</td>
<td>3.55***</td>
</tr>
<tr>
<td></td>
<td>(3.25)</td>
<td>(4.57)</td>
</tr>
<tr>
<td>IC Host</td>
<td>-0.01</td>
<td>-0.04</td>
</tr>
<tr>
<td></td>
<td>(-0.04)</td>
<td>(-1.45)</td>
</tr>
<tr>
<td>INST HOST</td>
<td>-0.21</td>
<td>-0.15***</td>
</tr>
<tr>
<td></td>
<td>(-0.61)</td>
<td>(-3.09)</td>
</tr>
<tr>
<td>INFRA HOST</td>
<td>-0.40</td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td>(-1.38)</td>
<td>(1.08)</td>
</tr>
<tr>
<td>lnTax Host</td>
<td>-2.91</td>
<td>0.84</td>
</tr>
<tr>
<td></td>
<td>(-0.88)</td>
<td>(0.73)</td>
</tr>
<tr>
<td>lnTax Parent</td>
<td>0.48</td>
<td>-2.59</td>
</tr>
<tr>
<td></td>
<td>(0.57)</td>
<td>(-1.26)</td>
</tr>
<tr>
<td>Distance</td>
<td>-1.89***</td>
<td>-0.55</td>
</tr>
<tr>
<td></td>
<td>(-6.65)</td>
<td>(-0.29)</td>
</tr>
<tr>
<td>Intercept</td>
<td>28.78</td>
<td>-2.28</td>
</tr>
<tr>
<td></td>
<td>(1.00)</td>
<td>(-0.27)</td>
</tr>
<tr>
<td>Observations</td>
<td>247</td>
<td>247</td>
</tr>
<tr>
<td>Sargan P Value</td>
<td>0.11</td>
<td>0.11</td>
</tr>
<tr>
<td>F Test for Weak Instruments</td>
<td>10.89</td>
<td>11.22</td>
</tr>
<tr>
<td>RSQ</td>
<td>0.86</td>
<td>0.91</td>
</tr>
</tbody>
</table>

Source: Gnanaraj (forthcoming).

Note: lnGDP Sum = log of the sum of GDPs of host and parent country, lnSKi/SKj = relative skill endowments, lnFSKi/FSKj = relative future skill endowments (enrollment in tertiary education), Turkey Pop/Host Pop = Turkish diaspora, IC Host = host investment costs; INST HOST = institutions, INFRA HOST = infrastructure, lnTAX HOST, lnTAX PARENT = corporate tax in host and parent country, respectively; Column 1 shows second-stage, two-stage least square regression results for FDI stocks in Turkey for the period 2000-12; column 2 presents the results for aggregate outbound stocks, including the total Turkish diaspora stocks.

\(^{91}\) A Sargan test for over-identifying restrictions is used to test for the validity of instruments. The instruments adopted are valid if the p value is greater than 0.1.

\(^{92}\) The instruments are considered weak if the F-statistic for the first stage is less than 10.
### Table A.7: Impacts of Differences in Skilled Migrant Stocks on Inbound and Outbound FDI, 2000-2012

<table>
<thead>
<tr>
<th>Regressors</th>
<th>Inbound FDI</th>
<th>Outbound FDI</th>
</tr>
</thead>
<tbody>
<tr>
<td>lnGDP Sum</td>
<td>1.70***</td>
<td>-0.53</td>
</tr>
<tr>
<td></td>
<td>(3.52)</td>
<td>(-0.89)</td>
</tr>
<tr>
<td>lnSKi/SKj</td>
<td>2.91**</td>
<td>-6.68***</td>
</tr>
<tr>
<td></td>
<td>(1.99)</td>
<td>(-2.70)</td>
</tr>
<tr>
<td>lnFSKi/FSKj</td>
<td>-0.63**</td>
<td>-3.57**</td>
</tr>
<tr>
<td></td>
<td>(-1.98)</td>
<td>(-2.03)</td>
</tr>
<tr>
<td>lnSKIMi/SKIMj</td>
<td>-1.17***</td>
<td>-3.26***</td>
</tr>
<tr>
<td></td>
<td>(-2.55)</td>
<td>(-2.98)</td>
</tr>
<tr>
<td>IC Host</td>
<td>-0.18**</td>
<td>-0.15***</td>
</tr>
<tr>
<td></td>
<td>(-2.21)</td>
<td>(-3.19)</td>
</tr>
<tr>
<td>INST HOST</td>
<td>-0.26</td>
<td>-0.18**</td>
</tr>
<tr>
<td></td>
<td>(-0.57)</td>
<td>(-1.97)</td>
</tr>
<tr>
<td>INFRA HOST</td>
<td>-0.17</td>
<td>0.31</td>
</tr>
<tr>
<td></td>
<td>(-0.13)</td>
<td>(1.50)</td>
</tr>
<tr>
<td>lnTax Host</td>
<td>-1.77</td>
<td>-1.60**</td>
</tr>
<tr>
<td></td>
<td>(-0.58)</td>
<td>(-1.96)</td>
</tr>
<tr>
<td>lnTax Parent</td>
<td>0.15</td>
<td>1.85</td>
</tr>
<tr>
<td></td>
<td>(0.08)</td>
<td>(1.46)</td>
</tr>
<tr>
<td>Distance</td>
<td>-1.09**</td>
<td>-1.04</td>
</tr>
<tr>
<td></td>
<td>(-2.12)</td>
<td>(-1.38)</td>
</tr>
<tr>
<td>Intercept</td>
<td>46.95</td>
<td>-17.30</td>
</tr>
<tr>
<td></td>
<td>(1.30)</td>
<td>(-1.73)</td>
</tr>
<tr>
<td>Observations</td>
<td>208</td>
<td>208</td>
</tr>
<tr>
<td>Sargan P Value</td>
<td>0.09</td>
<td>0.10</td>
</tr>
<tr>
<td>F Test for Weak Instruments</td>
<td>9.66</td>
<td>10.25</td>
</tr>
<tr>
<td>RSQ</td>
<td>0.90</td>
<td>0.81</td>
</tr>
</tbody>
</table>

**Source:** Gnanaraj (forthcoming).

**Note:** lnGDP Sum = log of the sum of GDPs of host and parent country, lnSKi/SKj = relative skill endowments, lnFSKi/FSKj = relative future skill endowments (enrollment in tertiary education), Turkey Pop/Host Pop = Turkish diaspora, IC Host = host investment costs; INST HOST = institutions, INFRA HOST = infrastructure, lnTAX HOST, lnTAX PARENT = corporate tax in host and parent country, respectively; Column 1 shows second-stage, two-stage least square regression results for FDI stocks in Turkey for the period 2000-12; column 2 presents the results for aggregate outbound stocks, including the total Turkish diaspora stocks.

### Data Sources on Skilled Migrants, and Diaspora

Australia Department of Immigration and Border Protection

Bundesamt für Migration und Fluchtinge: Conditions of Entry and Residence of Third Country Highly Qualified and Highly Skilled Workers: The Situation in Germany.

Citizenship and Immigration Canada

Corridor Report on France: The Case of Turkish and Tunisian Immigrants

Corridor Report on Sweden: The Case of Iranian and Turkish Immigration

Corridor Report: Turkish and Chinese Immigration to the Netherlands

Danube University Krems: Department of Migration and Globalization: Migration and Labor Integration in Austria, 2013-14

Destatis Germany

EMN Focused Study: Attracting Highly Qualified and Qualified Third Country Nationals in Italy
European Migration Network: Immigration of International Students in the Netherlands

Immigration New Zealand

INSEE, France

Instituto Nacional de Estadística, Espana

Interact Research Report: Corridor Report on Belgium: Moroccan and Turkish Immigration in Belgium

International Migration: IMO Report for Norway

Ireland: Central Statistics Office (CSO)

Istat Italy

Japan Statistical Yearbook (2000-2012)

Norway: Immigration and Immigrants, 2010

Report from IMN Sweden: Attracting Highly Qualified and Qualified Third-Country Nationals to Sweden

SOM Working Papers: Demographics of Immigration: Austria

Statistics Belgium

Statistics Finland

Statistics Netherlands: CBS

Statistics Norway

Statistics Sweden (SCB)

Statistik Austria

Swiss Federal Statistics Office

UK Immigration Statistics