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Turkey's employment subsidy program under the great recession: a general equilibrium assessment

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ABSTRACT

The objective of this paper is to provide an impact analysis of the macroeconomic consequences of the employment subsidization programs in Turkey implemented under the post-2008 crisis period. To this end, an applied general equilibrium model (of the *computable general equilibrium* – CGE variety) is utilized to investigate the production, incomes generation, and aggregate demand components of the domestic economy. The analysis highlights the rather limited returns to the subsidization package, and argues that much of this was due to the dis-equilibrating and fragile macroeconomic environment under the neoliberal policy framework. The massive drop of domestic savings; a severe mis-alignment in the real exchange rate causing significant appreciation of the domestic currency; rise of the external deficit and of foreign indebtedness along with a severe fall in the total productivity effort were different facets of this poor macroeconomic performance. Thus, an important message of the study is that, had the macroeconomic balances been maintained at their historical averages, and a more competitive exchange rate could have been pursued, as much as threefolds of a gain in aggregate employment could have been generated with the same intensity of the employment subsidization package, in comparison to the historically realized levels.

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1. Introduction

The global economy is under crisis since 2007. Over the course of the last eight years, the crisis had revealed itself under different sets of conditions over inflation in food and primary commodity markets; excessive financial speculation and fragility, and massive unemployment. According to ILO's estimates, global unemployment has increased from 170 million in 2007–205 million in 2014 (International Labor Organization 2014). The ILO further cautions that due to the recent slowdown in growth and the uncertain pace of recovery, the world economy is to be able to create only half of the 80 million jobs needed over the next two years to reach the pre-crisis employment rates. ILO's baseline projections report a likely increase in global unemployment up to 206 million in 2016, with about 65 million of the unemployed being young and 80 million women labor force.

Many countries introduced various programs to protect and promote their labor markets. Germany expanded its short-time work program (Messenger and Ghosheh 2013);

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Holland relied on its flexi-cure institutional structure; and many OECD members introduced active labor programs, while the US reverted to monetary expansion (dubbed as *quantitative easing*).

Turkey adopted a mix of general (covering all employees) and targeted (new hires, vulnerable groups, young, women, etc.) subsidies under a wide variety of programs, ranging from employment incentives based on regional support to active labor programs targeted to vulnerable groups. These were implemented mostly through reduced social security contributions, and were financed mostly by the proceeds of the unemployment insurance fund (UIF) and only partially by the Treasury. According to estimates, the aggregate costs of these programs amounted to roughly 0.5% of the gross domestic product (GDP), placing Turkey among the most aggressive subsidizing countries among the OECD. The employment multiplier of such programs was estimated to be around 0.91 (Yeldan 2011, 2010; State Planning Organization 2010).

The main objective of this study is to provide an impact analysis on the efficiency and macroeconomic consequences of the employment subsidization programs in Turkey under the post-2008 crisis period. To this end, an applied general equilibrium model (of the *computable general equilibrium* – CGE variety) is utilized to investigate the production, incomes generation, and aggregate demand components of the domestic economy. The main strategy of the analytical approach is to assess the economic impact of the implemented employment subsidy programs by raising the question of ‘what would have happened in the absence of such programs?’ The (counter-factual) analysis rests on the deviations from the historically observed macroeconomic, sectorial and labor outcomes, and is carried over 2008–2013.

The distinguishing feature of the analytical approach is that the net impact analysis is not confined to the labor markets alone, but encompasses resolution of the macroeconomic aggregates as well as the micro/sectorial outcomes. By utilizing the CGE apparatus as a social sciences laboratory, I extend the analysis to cover both the inter-sectoral and the inter-temporal effects of the implemented employment subsidy programs on domestic resource allocation, (functional) income distribution, and fiscal, as well as external balances.

There is a wide spectrum of views and much disagreement on the efficacy and the net overall impact of such programs in the literature (see e.g. Betcherman, Daysal, and Pagés 2010; Card, Kluve, and Weber 2010; Heckman, Lalonde, and Smith 1999; Jespersen, Munch, and Skipper 2008; Kluve 2010). Kluve (2010), for instance, notes that the effectiveness of the programs rely mostly on the ‘program type’, rather than ... ‘contextual factors such as labor market institutions or the business cycle’ (p. 904). In the Turkish context, based on a difference-in-differences econometric exercise of counterfactual analysis, and focusing on a select subset of the employment subsidization package, (Betcherman, Daysal, and Pagés 2010) report that those programs led to significant gains in formal employment, yet ‘the cost of job creation had been high due to the substantial deadweight losses’ (defined by the authors as ‘the number of jobs that would have been created independently of the subsidy programs’) (710, 711). A similar conclusion was reached independently by Balkan, Soner Baskaya, and Tumen (2014) who, based on a similar methodology, found that the estimates of the subsidy on targeted groups (youth and women) were statistically insignificant revealing that ‘the program had a negligible impact’ (3). Ercan (2010) and Yeldan (2013, 2010), based on their desk-study of the available data, report that the overall

efficiency of the active labor programs complemented by the short-time work program in 2008/09 was limited, and had suffered from a high fiscal burden.

This study expands these results in two ways: *first*, due to its general equilibrium structure, it encompasses both the macro aggregate and the sectorial detail of the implemented subsidization programs rather than focusing solely on the labor market results alone. *Second*, and more importantly, given its analytical tractability of the inter-sectoral and inter-temporal price signals and the corresponding commodity and resource flows, it goes beyond the simple narration of the empirical findings, and enables us to analyze in depth the adjustment mechanisms invigorated within an open economy macroeconomic framework. The results corroborate with the previous findings highlighting the rather limited returns to the subsidization package; and argue that much of this was due to the disequilibrating and fragile macroeconomic environment surrounding the national economy under the neoliberal era. The massive drop of domestic savings; a severe misalignment in the real exchange rate causing significant appreciation of the domestic currency; rise of the external deficit and of foreign indebtedness along with a severe fall in the total productivity effort were different facets of this poor macroeconomic performance. Thus, an important message of the study is that, had the macroeconomic balances were maintained at their historical averages and a more competitive exchange rate could have been pursued, with the same intensity of the employment subsidization package, as much as threefolds of a gain in aggregate employment could have been generated in comparison to the historically realized levels. These hypotheses mainly rest on the vision set forth in [Rodrik \(1992\)](#), in that, the macroeconomic climate ultimately sets the course of efficacy of the micro/sectorial reforms; and that much of the expected gains from *micro level* reforms hinge upon the successful performance of the *macroeconomic fundamentals* at the background.

The remaining pages of the paper are organized in five additional sections. The following section introduces the salient program features and the institutional background of the subsidy packages. The analytical components of the CGE model are introduced in Section 3, and its historical tractability is presented in Section 4 along with a brief account of the recent history of the Turkish economy. The counterfactual impact analysis is implemented under four distinct scenarios in Section 5, while Section 6 summarizes and concludes. The data-set of the CGE model is tabulated in a separate Appendix.

2. Main components of Turkey's employment subsidization program

Turkey has been one of the hardest hit economies under the global crisis. The repercussions were severe on the industrial sectors, in particular industrial employment. With a historical collapse of the industrial real output by 24% in January 2009, and the aggregate GDP by 14.9% in the first quarter of 2009, Turkish labor markets were faced with a severe contraction in demand. Open unemployment ratio increased from an average of 9.5% in 2008 to a historical high of 16.1% in February 2009.

In response to the darkening economic conditions, the Turkish government enacted a series of stimulus packages starting in the last quarter of 2008. The first employment package was announced in October 2008 with mostly provisions for reductions in social security premiums and other cost items for the employers. This package was complemented in February 2009 where the short time employment program (*reduced working time program* in the official Turkish jargon) was vitalized. Finally, a further package was

announced in May of 2009 with a wider set of fiscal stimulus measures directed for employment and aggregate demand.

The subsidization package was introduced and administered by the Ministry of Labor and Social Security (MLSS) and Turkish Employment Agency (Iskur) which was established in 2003. The MLSS had initiated a series of preparations in 2009 to bring all existing employment incentive schemes under one unified program commensurate with the newly invigorated *National Employment Strategy* (NES) document. The NES was further introduced as a priority task within the *Ninth Development Plan (2007–2013)* and was finally accepted as an independent strategy concept in 2014. The NES exclusively underlined policies to enhance the education-skill acquisition and employment links, and targeted to advance both the securitization and flexibility of the labor markets. It further set the stage for specific targets and the subsidization policies to be implemented within an overall macroeconomic framework. On a broader time horizon, it set specific quantified targets for employment, unemployment and reductions of the unregistered (informal) employment status. Accordingly, it was envisaged to reduce the open unemployment ratio to 5%, increase the employment rate to 55%, and reduction of the informal employment share to 15%.

2.1. The employment subsidization package

The first component of the subsidization package was the ‘Employment Subsidies for the Development Priority Regions’ program. The program had a broader aim to promote regional development and to reduce regional income disparities through tax and social security premium breaks, subsidized land and credit allocations to foster fixed investments, and energy utilization support. It targeted those enterprises that operate in the ‘developing regions’ with a per capita income less than 1500\$ and employ 10+ workers. Within the program, 80% of the employer share of the social security premium was taken over by the Treasury (100% if the enterprise were founded within an organized industrial park). It has to be noted that the program addressed not only to the newly employed workers, but to all employees that had been in employment. This feature was mainly instrumental in bringing an increase of 26% in the number of participating firms and of 271% in the number of workers engaged over 2009–2012. The program was modified in 2013 and was extended with the addition of a six percent further reduction in the social security premium for those firms engaged in municipalities with the recognized development priority.

Yet, the most popular component of the subsidization measures was the so-called ‘5-point subsidization programme’. With this, 5% of the employer premium dues were taken over by the Treasury for those firms that do not have any former debt on social security commitments, irrespective of the status of regional development. It covered all registered workers employed by the private sector enterprises that were not engaged in sub-contracting. This last condition on eligibility was quite instrumental in expanding the formal share of employment within the program. Like the previous one, this current program was also targeted to all employees, existing as well as newly employed.

‘New’ employment was targeted under the ‘Programme on Subsidization of Woman and Young Employment’ (Article no 4447). It covered women and young employment (ages 18–29) and was available only to those *new* workers employed additionally over the average number of employed in the previous month in question. It had a differentiated

Table 1. Main components of the employment subsidization programs in Turkey.

	Summary information	Requirements for eligibility
5084 – Subsidization of municipalities with development priority	Until 2012; 80% of employer share of soc sec premiums met by the Treasury (100% for OIRs)	Developing regions: per capita income less than 1500\$; for those firms with 10+ workers
6486 – Regional subsidization of 6 points of soc sec premium	After 2013, replaced 5084	Firms with 10+ workers
5510 – 5 point reduction in premiums	For firms that have no SSA premium debt; 5% of the employer premium dues met by the Treasury	For registered workers only with no previous debt to the SSA
6111 – Subsidization of occupation sufficiency for women and young	For targeted workers with occupation eligibility	Covers workers age 18 and above; for those workers that had been additional to the average no of employed of the previous month; for firms with no previous debt to the SSA
4447 – Subsidization of woman and young emp	For young and women employed 01.01.2008–30.06.2009: employer share of SSA premiums of 100% 1st year; 80% 2nd; 60% 3rd; 40% 4th; 20% 5th year covered from the UIF	For ages 18–29 and women above 18; available only to those new workers employed in addition to the average no of employed in the previous year, July 2007–June 2008
4857 – Subsidization of handicapped labor	For firms to meet the legal requirement to have 3% of their employers as handicapped, 100% of the relevant SSA premium is met by the Treasury	Firms with 50+ workers
25510 – Subsidization of employers with investment certificates	For firms under state guaranteed investment support program, all SSA premiums are covered by the Min of Development; with duration of 2–7 years of support, on average	For firms that hold certificate of regional investment subsidization; with a differentiated duration depending on the region and sector. For those workers that had been additional to the average no of employed of the last 6 months
5746 – R&D subsidization	Introduced in 01.10.2008 for subsidizing R&D expenditures of firms	Available up to 10% of R&D staff premiums
5225 – Subsidization of cultural investments	For firms with ‘certificate of cultural investment’; 50% of SSA premium for 3 years; for firms with ‘certificate of innovation’ 25% of SSA premium for 7 years are met by the Treasury	For registered workers only with no previous debt to the SSA, for eligible firms
5921 – Subsidization of unemployment insurance premiums	Introduced 01.10.2009 for indefinitely; 1% of the short-term SSA premium and all health insurance premiums are met over the period of eligibility for those firms who employ previously unemployed workers who were receiving unemployment insurance benefits	For those employees who were unemployed and were receiving unemployment insurance benefits; for those workers that had been additional to the average no of employed of the last 6 months; for firms with no previous debt to the SSA

scale in granting reductions to the social security premiums. The subsidization package further entailed elements to cover Research and Development (R&D) investments; to target vulnerable groups and various other social objectives. The complete program is tabulated and summarized in Table 1.

Table 2, in turn, summarizes the fiscal burden of the subsidization program across years and its components. As can be seen, the ‘5-point reduction’ subsidy (Article no 5510) comprised almost 90% of the fiscal costs of the overall package. The subsidization costs were 3.5 billion TRY in 2009 and reached to 7.8 billion TRY in 2013. As a ratio to the GDP these costs amounted to 0.38% in 2008, and to 0.5% in 2013, and were calculated to reach between 2.04% (2008) and 2.32% (2013) of the aggregate fiscal expenditures of the general government tax revenues.

Table 2. Employment subsidy expenditures (millions TRL).

	2008	2009	2010	2011	2012	2013
5510 – 5 point reduction in premiums	702.173	3324.801	4103.671	4784.004	5755.786	6893.790
6111 – Subsidization of occupation sufficiency for women and young	–	–	–	122.168	352.363	516.697
5746 – R&D subsidization	13.959	49.506	70.700	97.541	97.056	108.582
4857 – Subsidization of handicapped labor	19.500	43.874	57.247	61.787	71.767	93.275
25510 – Subsidization of employers with investment certificates	–	–	–	1.954	13.401	43.409
4447 – Subsidization of woman and young emp	14.095	60.441	103.511	48.054	19.913	8.497
5225 – Subsidization of cultural investments	0.103	0.063	0.254	0.560	0.694	0.845
5921 – Subsidization of unemployment insurance premiums	–	0.004	0.223	0.079	0.259	0.373
5084 – Subsidization of municipalities with development priority	717.630	741.280	925.920	1089.750	1263.060	–
6486 – Regional subsidization of 6 points premium	–	–	–	–	–	84.804
<i>Total</i>	<i>1467.461</i>	<i>4219.970</i>	<i>5261.525</i>	<i>6205.897</i>	<i>7574.298</i>	<i>7750.272</i>
GDP (billion TRL)	950,534	952,559	1,098,799	1,297,713	1,416,798	1,565,181
General government tax revenues (billion TRL)	172,251	176,136	216,109	260,262	285,695	334,445
Total subsidy/GDP (%)	0.15	0.44	0.48	0.48	0.53	0.50
Total subsidy/gen gov. tax rev. (%)	0.85	2.40	2.43	2.38	2.65	2.32

3. Algebraic structure of the analytical model

The analytical model distinguishes 13 sectors aggregated from the 2002 Input/Output (I/O) statistics for Turkey. Each sector is assumed to operate via the workings of a ‘representative’ firm which makes production and employment decisions. Each ‘firm’ employs physical capital, and two categories of labor: informal (vulnerable), and formal labor. Informality of the labor type is based on the ILO’s (International Labor Organization) conceptualization as (1) unregistered employment that is not covered by any social security package; (2) self-employed, and (3) unpaid family laborers.

Formal labor real wage rate is regarded exogenous and the formal labor market clears via quantity adjustments on employment. Given labor demand by optimization over real marginal productivity, and given exogenously set real wage rates, unemployed formal labor is found endogenously. In the validation exercise of the historically realized path, the path of unemployment is simulated closely to match historical data over 2009–2013.

Conceptualized on an abstract level, sectorial gross output, X^S is produced by physical capital, K , labor, L , and intermediate inputs. Output is marketed either domestically, DC , or exported, E . Total absorption is DC plus imports, M , and is used as private and public consumption, C and G , investment expenditures, I , and total intermediate input demand, INT . The intermediate input demand is generated via Leontieff input–output coefficients. Sectorial value added ($X^S - INT$) on the other hand is obtained via a two-stage production constant elasticity of substitution (CES) technology: in the top stage capital and labor aggregate forms value added, V ; at a lower stage this labor aggregate is derived from the CES composition of formal and vulnerable labor types. Balance of payments is maintained via endogenous solutions of the real exchange rate, to mock the ‘flexible floating’ exchange rate regime of Turkey.

Given this background, gross output is given by the following Leontieff technology between value added and intermediates:

$$X_i^S = \min [V_i, a_{1i}X_i^S, a_{2i}X_i^S, a_{3i}X_i^S, \dots, a_{13i}X_i^S,] \quad (1)$$

Here value added, V_i , and intermediate input uses, $a_{i,j}X_i^S$ are aggregated together along the fixed input–output Leontieff coefficients. Value added is found by aggregate labor, LA , and physical capital, KP along a CES function with limited substitution possibilities across the two factors:

$$V_i = A_i \left[\beta_i LA_i^{-\rho_i} + (1 - \beta_i) KP_i^{-\rho_i} \right]^{-1/\rho_i} \quad (2)$$

The aggregate labor is then composed of two types of labor, formal and vulnerable, both of which are indispensable part of sectorial labor input and substitute each other inelastically along a second CES functional,

$$LA_i = B_i \left[\gamma_i LF_i^{-\nu_i} + (1 - \gamma_i) LI_i^{-\nu_i} \right]^{-1/\nu_i} \quad (3)$$

As formal wage rate is exogenously fixed, unemployment is the end result of

$$UNEMP = LF^S - \sum LF_i^D \quad (4)$$

where supply of formal labor is given and sectorial labor demands are based on marginal productivity of formal labor. Factor incomes are channeled to the income pool of the representative household. Social security premiums and other labor taxes are cut from the formal wages and accrue to government's fiscal income. Operating surplus of the 'firms', likewise, is added to household income, along with other (exogenous) sources of income via public transfers and remittances abroad.

$$Y^{HH} = (1 - sstax)W^F \sum LF_i^D + W^I \sum LI_i^D + GtrHH + EtrHH + \epsilon ROWtrHH \quad (5)$$

In Equation (5) ϵ denotes the exchange rate, $ROWtrHH$ denotes the exogenous flows of remittances abroad, and $EtrHH$ and $GtrHH$ represent transfers from the enterprise sector and the government. $sstax$ is the tax rate on labor, inclusive of social security premiums. All of these flows are set at their historically realized values throughout the policy simulations.

Operating surplus of the enterprises (total disposable income of the private enterprise sector) is accounted by:

$$EtrHH = (1 - tk) \sum RP_i - EtrROW + r^D DomDebt^G - r^F \epsilon ForDebt^E + \epsilon ForBor^E \quad (6)$$

Here tk denotes the corporate tax rate on firm profits, $\sum RP_i$, $EtrROW$ is profit transfers to ROW, $r^D DomDebt^G$ is interest income on government debt instruments held by the enterprise sector, $r^F \epsilon ForDebt^E$ gives interest costs on foreign debt and $\epsilon ForBor^E$ narrates net new foreign borrowing by the corporate sector.

Government's (public sector) revenues are total direct and indirect tax revenues, tariffs and social security contributions:

$$GREV = \sum tn_i P_i^X X_i^S + \sum tm_i \epsilon P_i^W M_i + t_K \sum RP_i + t_Y Y^{HH} + sstax \sum W^F LF^D \quad (7)$$

Here tn_i refers to (net) production taxes (subsidy if negative); tm_i denotes the sectorial tariff rate on imports; t_Y is direct taxes on household income; t_K is corporate tax rate on corporate profit; and the last term is total social security taxes on formal labor. In an attempt to simulate the 'contractionary' fiscal policy stance of the period, the model follows

a prior rule to set the primary (non-interest) budget balance as a ratio to the GDP. Given the primary balance target, the non-interest expenditures are then rationed. Government's consumption and transfer expenditures are set as policy ratios to the available non-interest expenditures, and public investments, $GINV$, are treated residually to maintain the primary target rule. Thus government's total consumption expenditures are defined as,

$$GOVCON = gcr \cdot (GREV - r^F \epsilon ForDebt^G - r^D DomDebt^G) \quad (8)$$

with gcr serving as the policy induced aggregate consumption rate out of available fiscal expenditure funds. The balance on total public expenditures and public revenues yield the *public sector borrowing requirement* (PSBR).

$$PSBR = GREV - GCON - GINV - r^F \epsilon ForDebt^G - r^D DomDebt^G - GtrHH \quad (9)$$

PSBR is to be financed either through domestic ($\Delta DomDebt^G$) or foreign ($\Delta \epsilon ForDebt^G$) debt instruments.

3.1. Market equilibrium and dynamics

General equilibrium of the model economy is achieved by endogenous iterations on prices and the real exchange rate to clear the commodity markets and the foreign exchange market. The market for informal/vulnerable labor is also brought into balance by flexible wages. The 'low' value of the real wage rate as determined in the informal labor market is informative in conveying the extend of poverty among the vulnerable labor across sectors. The formal labor market clears through excess supply giving rise to open unemployment. In the commodity markets, aggregate sectorial absorption ($CC = X^S + M - E$) is equal to aggregate expenditures on private and public consumption, investment and intermediates across sectors.

Overall macroeconomic equilibrium (saving–investment balance) is obtained by,

$$P^{SAV} + G^{SAV} + \epsilon CAdef = P^{INV} + G^{INV} \quad (10)$$

In Equation (10) P^{SAV} and G^{SAV} give, respectively, private and public sector savings; $CAdef$ is the deficit on current account (foreign savings) and the right-hand variables are private and public investment expenditures. The current account deficit is given by the difference between export revenues, transfers from abroad and the sum of imports, enterprise profit transfers to abroad, and interest costs of foreign debt held by the enterprise and the public sectors:

$$CAdef = \sum P_i^W E_i + ROWtrHH - \left[\sum P_i^W M_i + EtrROW + r^F ForDebt_t^E + r^F ForDebt_t^G \right] \quad (11)$$

This equation is solved by flexible movements of the (real) exchange rate.

The model is updated in its exogenous flows, parameters and the policy variables along a dynamic path spanning the 2008–2013 history. Over this path first capital stocks are expanded via accumulation of investments, and labor supplies are updated with their historical realizations. All exogenous variables and parameters are set at their historically realized magnitudes. In an attempt to 'track' the historical path of the macroeconomic

aggregates, the sectorial total factor productivity (TFP) rates had been adjusted to mock for the boom-and-bust cycles of the Turkish economy under the turbulent conditions of the Great Recession.

On the determination of capital accumulation, the model distinguishes across private sector behavior (based on the profit motive) vs. public sector's policy priorities among the sectors. The public sector allocates its investment (by destination) expenditures via its priorities of strategic sectors. For the private sector, investment allocations are driven by the rate of sectorial profitability. Based on the notion of *Tobin's q*, the model first calculates the deviations of the sectorial profit rates from the economy-wide average, and distributes investment funds accordingly, with high profit sectors capturing a higher share of the investment fund. To characterize these actions formally, we first define sectorial profit rates as the difference between value added and wage costs per unit of capital:

$$r_i = \frac{P_i^{VA} X_i^S - w^F L F_i^D - w^I L I_i^D}{P_i^K K_i} \quad (12)$$

Capital investment (by destination) coefficients, DK_i , are then set via:

$$DK_i(t+1) = SP_i + \mu SP_i \left[\frac{r_i - r^{AVG}}{r_i} \right] \quad (13)$$

Here SP_i give the share of sectorial profits in aggregate, r^{AVG} is the economy-wide average profit rate and μ is an elasticity parameter to set the 'responsiveness' of the investment allocation coefficient to sectorial profit rate differences.

As a final step we will follow up the dynamics of debt accumulation. It is assumed that a portion, $gborrat$, of public sector borrowing requirement, $PSBR$, is financed by foreign borrowing, and the rest gives way to domestic debt accumulation. Thus we have the following rules of debt dynamics:

$$\begin{aligned} DomDebt_{t+1} &= DomDebt_t + DomBor_t \\ ForDebt_{t+1}^G &= ForDebt_t^G + ForBor_t^G \end{aligned}$$

with $DomBor_t = (1 - gborrat)PSBR$. Similarly, private enterprise debt accumulates via,

$$ForDebt_{t+1}^E = ForDebt_t^E + ForBor_t^E$$

The numéraire of the system is the exchange rate, ϵ .

4. The 2008–2013 realized path and its validation

4.1. The main features of the realized path, 2008–2013

Our next step is to utilize the CGE framework to trace and then to analyze the nature of the deviations from the historical path that the Turkish economy had followed over 2008–2013. With this exercise, we focus not only on the labor market outcomes, but will also be able to study the overall resolution of the macroeconomic balances, domestic as well as external equilibria.

As known, the analyzed period covers a very volatile history referred to as ‘great recession’ with a meager rate of growth and collapsing employment opportunities all around the globe. The repercussions of this episode were felt deeply in Turkey via wild swings with a collapse of the GDP by 4.8% in 2009, and then with the expansions of 9.2% (2010) and 8.8% (2011) to be followed by the almost stagnant per capita growth rates in 2012 and 2013. Rate of unemployment increased to 14% in 2009 and then almost got stuck at around the 9.5–10.0% range. (see Tables 3 and 4).

All of these were driven mostly by the speculative flows of hot money finance in closing the external gap (current account deficit). Availability of external finance ultimately defined the boundaries of growth and employment over this period. Years of widening current account deficit (2010 and 2011) as much as it could have been financed by inflows of short-term speculative capital were associated with a consumption-led boom. The savings performance of the private sector, in fact, literally collapsed to below the 10% mark, a fall by almost 15% points in comparison to the early 2000s. The collapse of private savings and the associated rise in the current account deficit were the two facets of the worsening macroeconomic fragility over this period. Negative real rates of interest and overall domestic rate of exchange were especially important in conveying signals toward exuberant consumption. The behavior of the real exchange rate (TRY/US\$) is summarized in Table 3, where it can be seen that in comparison to 2003 the Turkish Lira had appreciated by 21% in 2010, and then maintained its level throughout the crisis. The ongoing *Quantitative Easing* program in the US, outpouring cheap foreign liquidity in the global asset markets meant an opportune moment for Turkey and the other emerging market economies, fueling their consumption boom. The costs of this *speculative-led growth* episode was stagnation of real value added in the import-competing industries and the persistence of unemployment and informalization.

The sectorial composition of employment is a manifestation of these assessments. Of the total increase in employment (4393 thousands) from 2003 to 2013; a quarter belonged to agricultural employment (1002 thousands). Services absorbed 60% of this gain with 2660 thousands, while the share of construction was 400 thousands. Gains in industrial employment was a meager 500 thousands over the course of five years (Table 4). The alleged sustained expansion in agricultural employment, in particular, is enigmatic for a middle-income developing country such as Turkey, with rapid urbanization and structural transformation towards the urban sectors. Agricultural employment had fallen by about 2.5 million persons from 2002 to 2007; and contrasted against this trend, the sustained increase in rural employment over the course of the great recession warrants deeper questions, an issue that lies clearly beyond the scope of this paper. With construction employment remaining roughly constant at around 1.2 millions, most of the remaining labor surplus seems to have been absorbed by service sectors. Many researchers trace the roots of fragmentation and informalization of the urban labor to this trend, where small-scale services based on self-employment and family labor was mostly the observed norm (see e.g. Agénor et al. 2007; Bahce et al. 2011; Demirhan et al. 2011; Ercan and Tansel 2006; Independent Social Scientists Association 2011; Taymaz and Ozler 2005).

Table 3. Turkish economy over the 2000s.

	Economic crisis		Post crisis adjustment and growth		Global crisis		Patterns of recovery under the great recession				
	2001–2002	2003–2008	2003–2008	2009	2010	2011	2012	2013	2014	2015	
<i>Macro aggregates</i> GDP per capita (US \$)	3548	10,444	8561	10,003	10,428	10,459	10,807	10,390	9286		
GDP real rate of growth (%)	2.41	5.88	-4.82	9.15	8.77	2.12	4.00	2.90	4.00		
As % of GDP	70.12	69.84	71.46	71.69	71.18	70.19	70.87	71.01	71.05		
Consumption exp	14.63	21.78	14.93	19.52	23.55	20.13	20.62	20.55	20.12		
Investment exp	25.1	16.90	18.00	12.30	10.7	11.6	9.7	11.9	10.6		
Private savings	-10.5	-3.25	-5.5	-3.6	-1.4	-2.1	-1.2	-1.3	-1.2		
Budget balance	4.23	4.60	0.05	0.75	1.88	1.34	2.02	2.4	2.9		
Non-interest (primary) budget balance	38.49	35.50	34.64	32.11	28.42	27.28	25.81	26.3	26.45		
Public domestic debt stock											
<i>Internalization</i>											
Exports of goods (bn \$)	31.60	84.79	109.64	120.91	143.39	163.22	163.37	157.6	143		
Imports of goods (bn \$)	49.15	132.54	134.49	177.31	232.53	228.55	243.39	242.2	208.4		
Current account balance (bn \$)	-2.26	-26.16	-13.40	-45.42	-75.08	-48.49	-65.07	-46.5	-36.7		
Current account balance (% of GDP)	-1.43	-4.75	-2.27	-6.30	-9.70	-6.17	-7.40	-5.8	-5.2		
Total external debt (bn \$)	120.57	202.67	268.93	291.91	303.91	339.04	389.5	402.4	-		
Total external debt (% of GDP)	52.88	39.91	43.76	39.85	39.34	43.07	47.29	51.02	-		
<i>Macro prices</i>											
Consumer prices (yearly % change)	33.13	11.81	6.50	6.40	10.40	6.16	7.32	8.2	7.6		
Rael interest rate ^a	5.35 ^a	11.80 ^a	0.01	0.01	-0.02	-0.44	-0.74	-0.81	-0.9		
Index of real exchange rate (TL/\$)	-	88.70	87.70	79.37	89.29	86.21	87.72	91.1	92.2		
(2003 = 100)											

^a GDI interest rate for 2001–2002 and 2003–2008; CBRT policy rate (one-week repo rate) for post-2009. All deflated by the CPI.

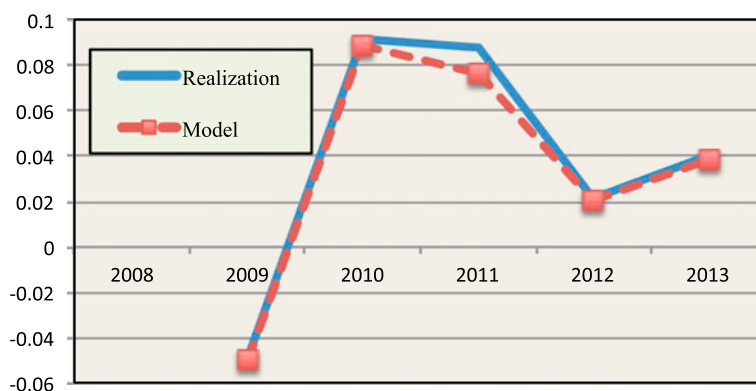
Sources: TURKSTAT, min of development data bases; CBRT electronic data dissemination system.

Table 4. Components of the Turkish labor markets.

	2008	2009	2010	2011	2012	2013	2014	2015
15+ Civil population	50,772	51,686	52,541	53,593	54,724	55,608	56,986	57,854
Civilian labor force	23,805	24,748	25,641	26,725	27,339	28,271	28,786	29,678
Total employment	21,194	21,277	22,594	24,110	24,821	25,524	25,933	26,621
Participation rate	0.47	0.48	0.49	0.50	0.50	0.51	0.51	0.51
Open unemployed	2611	3471	3046	2615	2518	2747	2853	3057
Open unemployment rate (%)	11.0	14.0	11.9	9.8	9.2	9.7	9.9	10.3
Non-agricultural unemployment rate (%)	13.6	17.4	14.8	12.4	11.5	12.0	12.0	12.4
Vulnerable employment ^a	10,770.68	10,972	11,467	12,008	11,630	11,428	–	–
Vulnerable emp ratio (%)	0.51	0.52	0.51	0.50	0.47	0.45	–	–
<i>Employment by sectors</i>								
Agriculture	4621	4752	5084	5412	5301	5204	5470	5483
Industry	4537	4179	4615	4842	4903	5101	5316	5332
Construction	1238	1305	1434	1680	1717	1768	1912	1914
Services	10,208	10,380	10,725	11,332	12,016	12,528	13,235	13,891

^a‘Vulnerable employment’ according to the ILO definition: unregistered employment with no social security coverage + self-employed + un-paid family labor.

Source: Turkish Statistics Institute (TurkStat), Household labor force surveys.

**Figure 1.** GDP real rate of growth.

4.2. Validation of the historical path

Now we turn to the analytical workings of our model. Our first task is to ensure that the endogenous dynamic solutions of the analytical model trace the historically realized values of macroeconomic aggregates and the labor markets. To accomplish this, the strategy to pursue was to calibrate the historically realized values of employment and to solve for wages and the TFP rates endogenously. Among the macroeconomic variables the most important one is surely the GDP and its components. As discussed above, the realization of the GDP path both in real rates of growth and in nominal valuation had been on a volatile trend. Nevertheless, the modeling exercise was quite satisfactory in tracking this volatile path both in the real rates of growth and nominal levels. Figure 1 compares the simulated vs. historical values of the real growth, while Figure 2 narrates the same comparison for the nominal levels. Thus the model solutions are observed to successfully track not only the real, but also the nominal values, taking account of the price effects.

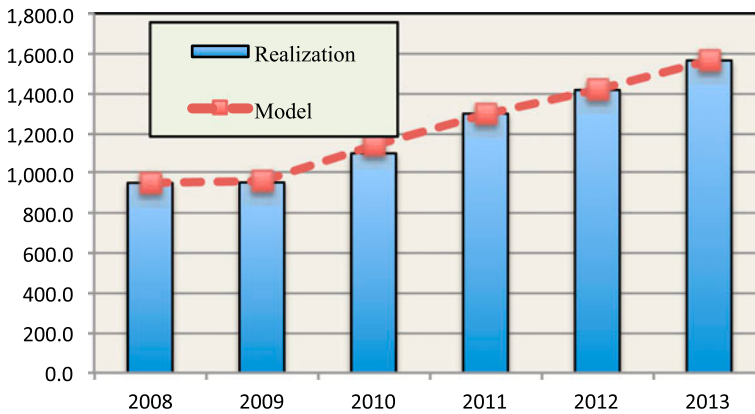


Figure 2. Nominal GDP (billion TRL, curr prices).

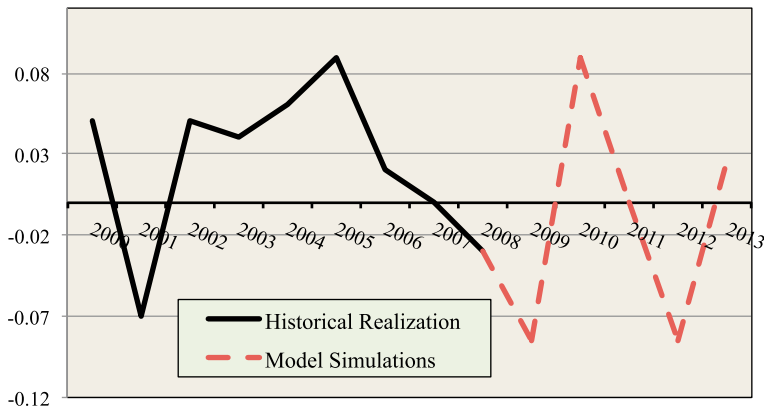


Figure 3. Total factor productivity in Turkey, 2000–2013.

The TFP path as obtained by the endogenous solutions of the model offers us important information regarding the productivity performance of the domestic economy. Estimates of the historically realized rates of TFP growth were obtained from (Kolsuz and Erinc Yeldan 2014). These estimates are contrasted against the model solutions and projections beyond 2008 in Figure 3. As observed, TFP growth was quite rapid over 2002–2006, it was, nevertheless, on a declining trend after 2006. Following the collapse of the rate of growth of TFP during the 2009 global crisis, its performance was quite meager and volatile after 2010.

The model distinguishes a segmented structure in its characterization of the labor markets. For the *formal/registered* labor market real wage rate is fixed and the market clears via quantity adjustments, while the informal (vulnerable) labor market clears via flexible wages. Simulated unemployment rates are narrated in Figure 4, while the aggregate employment level is tracked in Figure 5. The model's tracking ability is found satisfactory over a period when the unemployment rate ranged between 9 and 14.5%. In Figure 6 the share of formal employment in aggregate is displayed. As observed, the share of formal

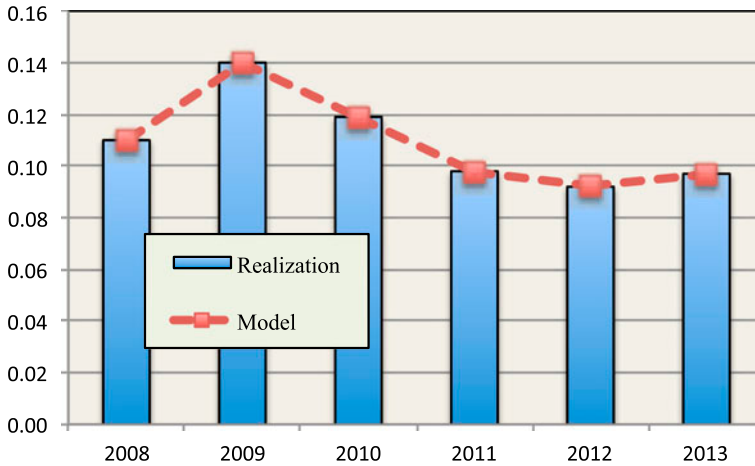


Figure 4. Unemployment rate.

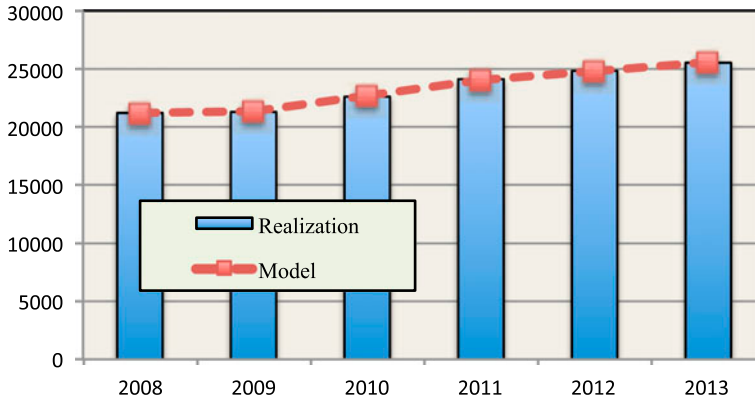


Figure 5. Total employment (1000 persons).

employment has fallen during the 2009 crisis, and recovered thereafter to reach a 6% higher value by 2013. This should be ascribed to the stimulus provided by the conditionalities of the subsidization package, as noted in Section 2 above.

The most important component of the validation exercise is the model’s analytical ability to track the fundamental savings – investment equilibrium (see Equation (10) above):

$$\text{Private Savings} + \text{Public Savings} - \text{Investment Expenditures} = \text{Foreign Savings (Current Account Balance)}$$

The model’s algebraic setup sets the ratio of private and public savings to a given ratio (marginal propensity to save) of their respective disposable incomes (solved endogenously). Current account deficit is calibrated to the historical realized path and the investment expenditures are then resolved endogenously. It must be noted at the outset that there had been many inconsistencies in bringing together the aggregate macroeconomic data, such as fiscal revenues/expenditures, foreign trade and external capital flows, as derived from diverse sources. In order to maintain the fundamental macroeconomic

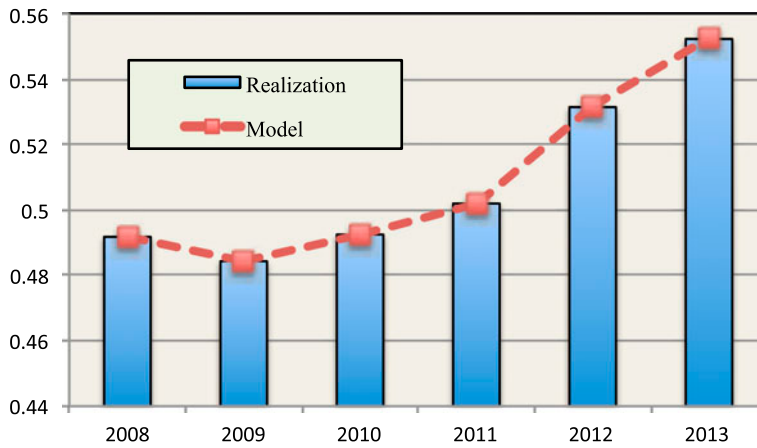


Figure 6. Formal employment/total.

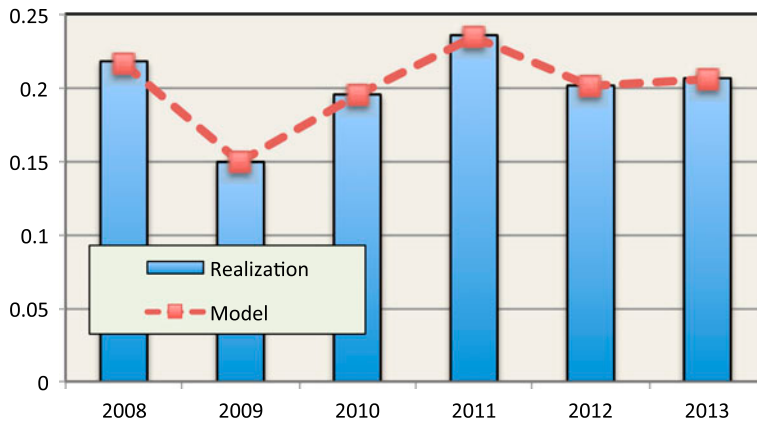


Figure 7. Investment exp./GDP.

equilibrium noted above, private consumption expenditures had to be set residually to pick up the imbalances at the aggregate level. In what follows, the observed divergences of the consumption path document the ‘size’ of such inconsistencies stemming from the official national income accounting statistics. The set of Figure 7 through 10 portray the resolution of this equilibrium where it can be seen that the model’s tracking ability of the fundamental macro aggregates have been quite robust with deviations of only a maximum of 2% points on the share of consumption expenditures in the overall GDP (Figures 8–10).

Another area of importance in our validation efforts is the behavior of sectorial allocation of employment. Patterns of sectorial employment are the end-result of the microeconomic processes whose resolution depends upon the relative price signals. As portrayed in Figures 4–6 the model’s simulated path captures patterns of *aggregate* employment quite closely. In the next step, Figures 11 through 14 document the model solutions on *sectorial* employment and contrast the results with the historically realized paths. As noted above the most distinguishing characteristic of the sectorial patterns of employment over the

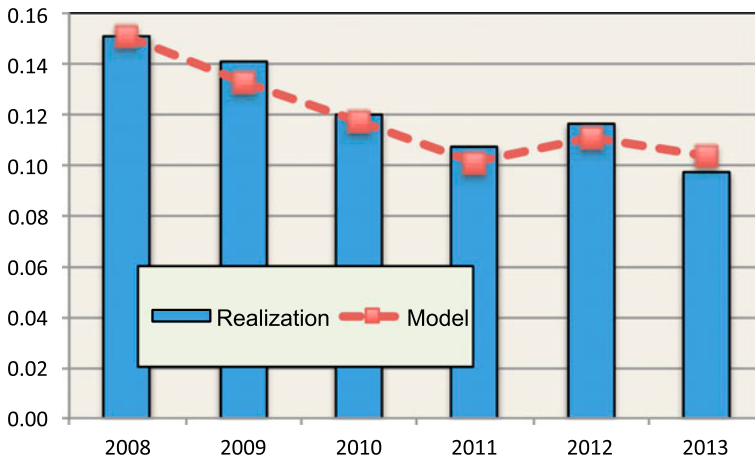


Figure 8. Private savings/GDP.

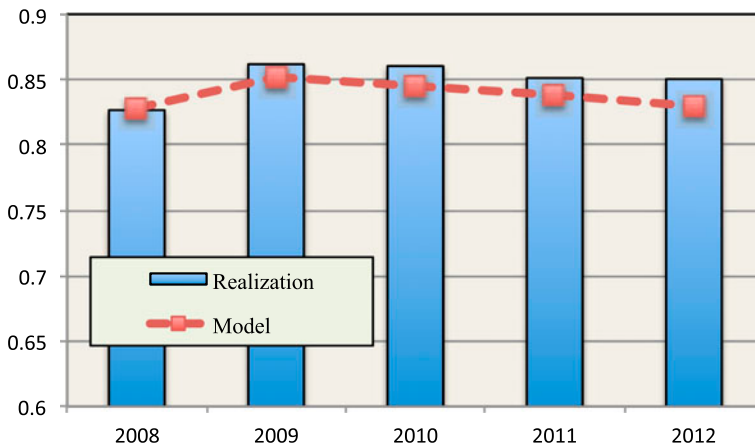


Figure 9. Consumption exp./GDP.

post-2009 era was the expansion of agricultural employment. Agricultural employment had increased by as much as 230 thousands even under the darkening conditions of the economic crisis in 2009. This process had continued secularly during the course of the great recession and reached to 1 million net new employment in agriculture by 2013. Industry, on the other hand, initially shed labor in 2009, and then recovered gradually with a net expansion of about 500 thousand workers in 2013 – contrasted to 2008. Services served as an employment sink, with 2.7 millions new employees between 2008 and 2013 (Figures 12–14).

Model simulations can track the historical path of the share of agricultural employment with a deviation of approximately 2%. In the non-agricultural sectors, industry and services are found to over-shoot the historical shares; while that of construction falls behind by around 2% points. Overall, the model’s sectorial employment results can be said to remain within bounds of tolerance in their validation of the historical results. The observed

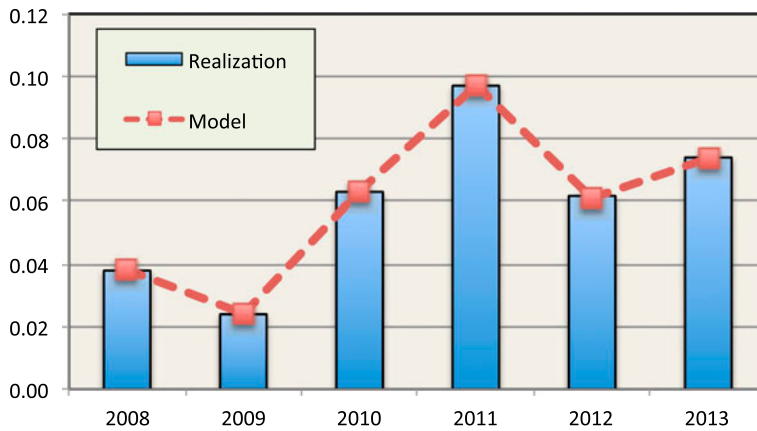


Figure 10. Current account deficit/GDP.

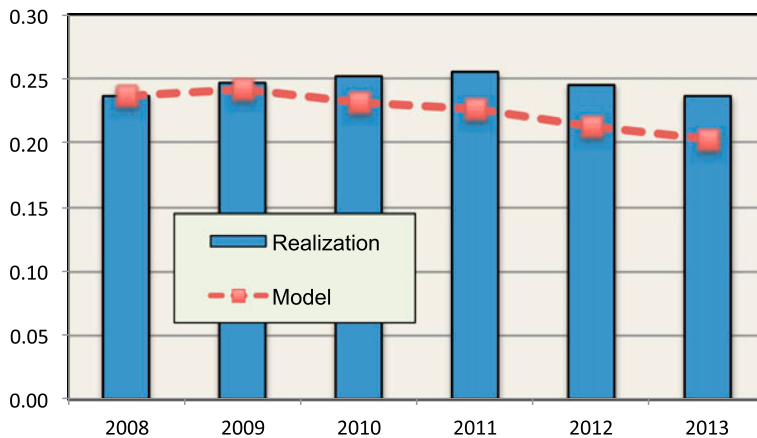


Figure 11. Agricultural employment/total.

deviations, amounting to no more than 2% points, should be regarded normal for an era with abrupt swings in economic activity and sudden shocks.

Armed with this background, I now turn to the conduct of ‘what if?’ scenarios.

5. Analysis of alternative policy environments

In this section, I follow up the counter-factual policy simulations characterizing alternative policy environments. To this end, the model’s policy parameters and exogenous variables are perturbed to generate new paths that serve as alternatives to the ‘base-path’ that simulates the historical realizations over 2009–2013. Deviations with respect to the base-path will provide us with a quantified assessment of the relative strengths of the alternative policies to the historically implemented policy schemes.

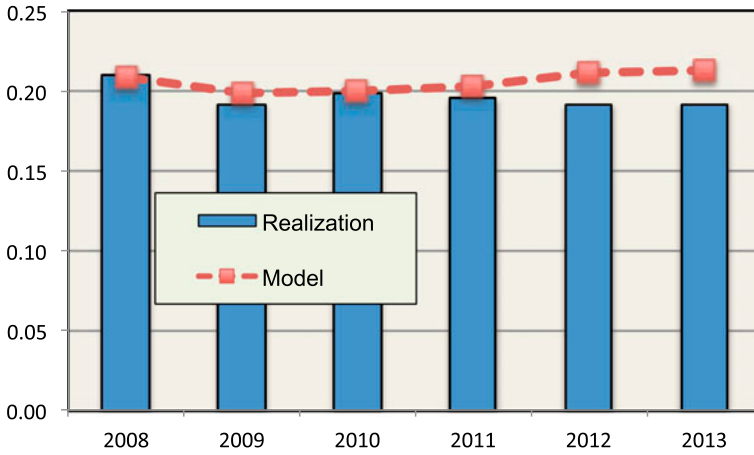


Figure 12. Industrial employment / total.

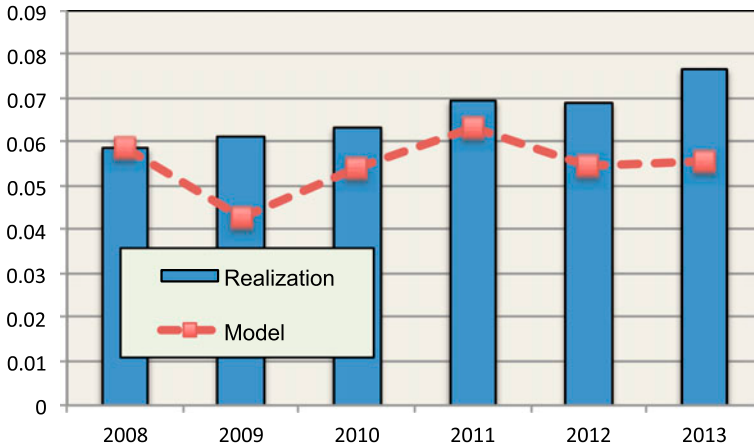


Figure 13. Construction employment / total.

5.1. Scenario 1: What would have happened if the subsidy package had not been implemented, ceteris paribus?

Compiled data from the TurkStat’s *Household Labor Force Surveys* and *fiscal accounts* reveal that the fiscal costs of the employment program were on the order of 0.4% as a ratio to the GDP, hovering around 0.5% after 2011 (see Tables 2 above, and 5 below). Yeldan (2010) estimates, which have also included the stimulus package granted to the banking and the financial sectors, found that the overall stimulus package cost 2.4% as a ratio to the GDP in 2010 and 2011. Balkan, Soner Baskaya, and Tumen (2014) who had focused mostly on women and young employment with a different methodology, report the costs of the relevant subsidization scheme to 0.35 to the GDP.

In this first scenario, we focus on the main question of this study: If the subsidization package that amounted to 0.4–0.5% as a ratio to the GDP were not implemented, how would

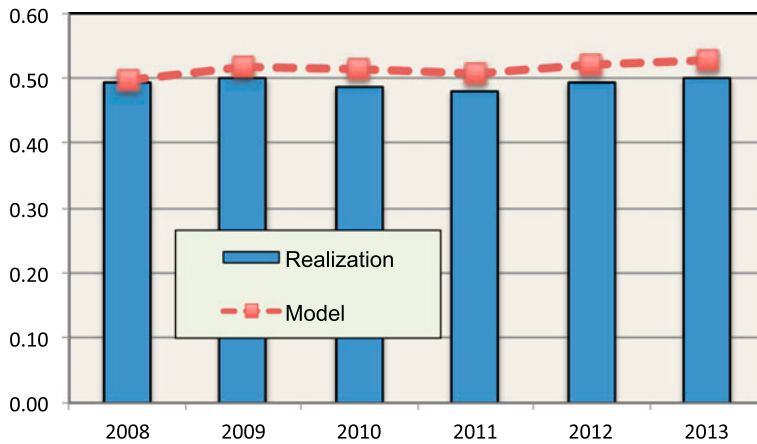


Figure 14. Services Employment/total.

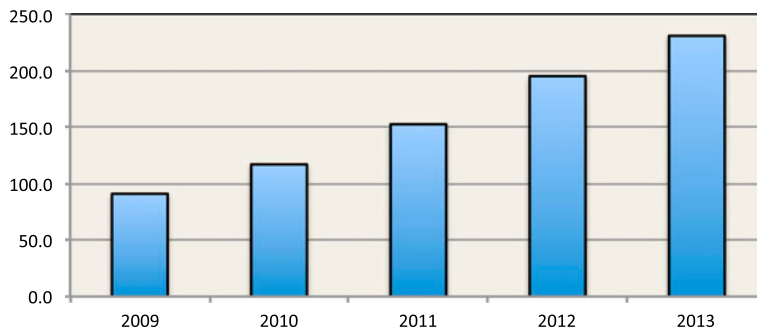


Figure 15. Gains in employment under the subsidization program (1000 persons).

the Turkish macroeconomic environment and the labor markets be affected from the global crisis? If we reverse the question: in comparison to a hypothetical policy environment where no subsidies were granted (Scenario 1), what were the gains in employment and economic activity under the historical realizations between 2009 and 2013?

The scenario analysis is conducted by increasing the tax burden on the (formal) labor market that aims at reversing the subsidized employment taxes. Results are narrated in Table 5 and Figures 15 and 16.

Modeling results indicate that, had the subsidization package not been implemented, total employment would have been 21 million 186 thousands in 2009, rather than 21 million 271 thousands, as was historically realized. Consequently, unemployment rate would have been 0.4% points higher, reaching to 14.4%. This means that the subsidization packages had succeeded in protecting 91 thousand jobs in 2009. These gains are calculated to accumulate after 2010 to reach 230 thousands new employment created due to the package. According to the model simulations, under the Scenario 1, the unemployment rate would have been 10.5%, rather than 9.7% in 2013; and the share of formal employment in the aggregate would have been 54.8%, rather than 55.2%. Parallel to these results, real rate of growth of the GDP is calculated to be 3.7%, rather than 3.8% on average.

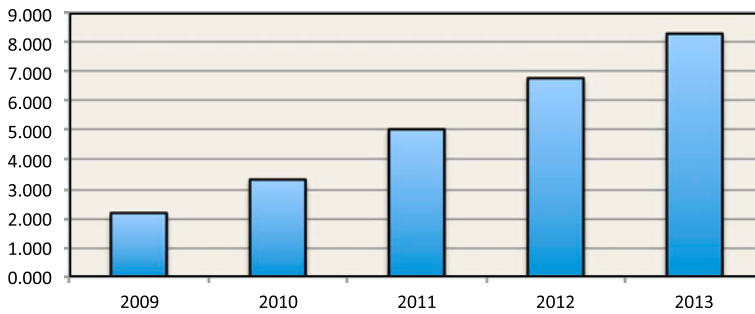


Figure 16. Gains in GDP under the subsidization program (billion TRY, fixed 2008 prices).

Thus, the model results suggest that the employment gains of the subsidization program ranged between 0.4% (2009) and 0.9% (2013) along the historical path, with gains in real GDP growth being quite marginal at about 0.1%.

These results corroborate with those analyses that had tackled the issue using different methodologies (see Balkan, Soner Baskaya, and Tumen 2014; Duman 2014; Efendioglu 2010; Yeldan 2013; Yeldan 2010). Balkan et al. report, based on their econometric analysis of *differences of differences*, that the impact of the woman and young employment subsidies had been marginal on the targeted groups. Yeldan (2010), in turn, analyzed the subsidy component of Turkey's *reduced work programme* and found that the effectiveness of the program in comparison to fiscal costs was quite marginal in generating employment gains, and argued that the marginal costs of the reduced work program were among the highest in the OECD countries that implemented similar measures. Thus, I argue that the overall impact of the total subsidy program was positive, yet quite mediocre. *What could have been the main structural reasons behind this outcome?* and starting from this question, *how could the program be implemented instead to yield more effective results?* These are the questions that I tackle in the next section.

5.2. If the macroeconomic balances could have been maintained: Scenario 2

Answers to these questions rest on our working hypothesis that the boundaries of micro sectorial policies are ultimately set by the overall macroeconomic environment they are situated in. The period in question displays an era of wild swings in real production and deepening fragilities for the Turkish economy. Among these were the (i) collapse of the (private) savings; (ii) significant misalignment of the exchange rate with strong real appreciation of the Lira; and as a consequence of these, (iii) significant deterioration of the external balances along with massive foreign indebtedness. All these are to be recognized as the major sources of deterioration of the fundamental balances and increased external fragility for the Turkish macroeconomy.

These concerns are taken in further detail in Yeldan (2011), Independent Social Scientists Association (2011) and Telli, Voyvoda, and Yeldan (2006). Appreciation of the domestic currency, the *Lira*, under open economy conditions has, without surprise, led to a widening trade gap and a consequent current account deficit. More importantly, currency appreciation meant adverse conditions for the import competing industries and

traditional exportables causing them to dwindle, while reduced import costs led to the adoption of more (foreign) capital-intensive techniques with lower labor content, such as automotives, auto spare parts, and consumer durables/electronics. As a result, the widening current account deficit meant not only increased fragility and disequilibria, but also lower employment opportunities and foreign debt accumulation.

These developments gave way to a current account deficit of 78.1 billion US\$ in 2011, or about 9.7% as a ratio to the GDP. In order to evaluate the meaning of this figure, it ought to be noted that Turkey has traditionally never been a 'deficit prone' economy. On a historical standard, Turkey's current account balance was typically maintained with roughly a plus or negative current account balance of 0.5–1.5% as a ratio to the GDP. Thus, the post-2009 deterioration of the current account balance along with the massive collapse of the private savings performance were the main shocks to the macroeconomy. Breaking with the long-term historical patterns for the Turkish economy.

Based on these observations I now forward this question: *If the employment subsidization program of 2008–2013 was implemented under a more balanced macroeconomic environment where such fragilities had not existed, what would be its net outcome?* We can formulate the question in a more technical fashion as follows: If the domestic savings were maintained at their historical averages of early 2000s at 18%; if the currency could have kept its real level (with about 12–15% higher real depreciation over its historical realization); and the current account deficit could be maintained at its 2009 level at 2.4% (already high given historical standards), could the implemented subsidization packages be more effective in generating higher employment?

Scenario 2 pursues these questions. The results of the scenario are displayed in Table 5. In a nutshell, it is observed that under a more competitive real exchange administration with a lower savings – investment gap (lower current account deficit), the subsidy program would have generated an additional aggregate employment of 93 thousands in 2009, and would reach to 337 thousands in 2013. This would mean an additional 568 thousand employment return contrasted against the Scenario 1. Various channels can be cited to be at work for explaining the adjustment mechanisms against the potential negative effects of external imbalances on employment. First is the *macroeconomic demand channel* proper. With the fall in net exports, national economy is expected to suffer from deflation in aggregate demand at least in the short run. This Keynesian channel was also underlined in the late history of the Latin American economies by [Frenkel and Ros \(2006\)](#) who report that domestic production and employment had been substituted for external activity over the externally fragile environment of the 1990s. This effect could further be reinforced with the pressure of intermediate imports to lower the ratio of value added in gross output. With the rise of the share of imported intermediates in gross production, domestic value added falls, with adverse consequences on employment. This latter effect is revealed by [Nucci and Pizzolo \(2010\)](#) in the context of currency appreciations. In their panel econometrics work on Italian manufacturing firms, Nucci and Pizzolo report that the response of jobs and hours worked to currency swings depends primarily on the firms' exposure to foreign sales and their reliance on imported inputs; with the degree of substitutability between imported and other inputs playing a key role in the metrics of employment sensitivities.

A second channel can be envisaged to operate through the *factor substitution effect*. Relative cheapening of (imported) capital directs producers to substitute out labor, generating pressures for a more capital-intensive input mix. A recent study on the TFP and revealed

factor ratios of the post-1990 Turkish industry as conducted by [Kolsuz and Erinc Yeldan \(2014\)](#) corroborate this prognostication. In their study of the estimates of (physical) capital utilization in Turkish manufacturing over the 1990–2010 period, They report that capital per labor had increased by more than twofolds in real terms.

Related to this one can conjecture a *dynamic efficiency channel*, wherein the long-term accumulation and productivity rates are distorted with adverse effects on the speed of generation of new jobs. The analytics of this route were formulated in a seminal paper by [Ros and Skott \(1998\)](#) and were studied empirically in [Frenkel and Ros \(2006\)](#) in the context of the Latin American economies. Determinants of dynamic efficiency and long run growth extend, surely, beyond the balance of the external economy. Long run growth is to be directly shaped by the position of the domestic economy in relation to the ladder of the global value chains, and the dynamic shifts in the heterogeneous composition of sectoral production play a key role in the resolution of the employment patterns. [Aksoy \(2013\)](#) and [Meschi, Taymaz, and Vivarelli \(2011\)](#) report the positive feedback mechanisms of trade generation and skill upgrading due to export penetration and capital imports with significant spillovers on skilled employment in Turkish manufacturing. In contrast, [Taymaz and Ozler \(2005\)](#), [Taymaz and Voyvoda \(2009\)](#) and [Taymaz, Voyvoda, and Yilmaz \(2008\)](#) caution on the strains of the ongoing substitution of skilled labor against the traditional lines of employment and document the loss in jobs particularly in food processing, textiles and mining and quarrying.

The mode of operation of these channels was not unidirectional, and necessitated indirect links via the currency and product markets. Here the key variables are the real exchange rate and the real rate of interest. A distinguishing feature of the Turkish economy over the 2000s was the relatively high real rates of interest. Higher interest rates together with a restrictive monetary stance were conducive in attracting capital inflows and controlling for inflationary pressures. Yet, the negative effects of high interest rates on employment are well-known ([Nickell and Nicolitsas 1999](#)). In the Turkish historical context, high interest rates in the post-2001 era signified strong inflows of speculative capital. It has to be recalled that the 2000's was the era of great moderation together with flexible (floating) exchange rate regimes, independent, inflation targeting central banks with the objective of price stability and freely mobile capital flows. In return to all these, Turkey witnessed severe appreciation of its currency, the Lira, over 2003–2008. The Lira had appreciated by as much as 60% in real terms against the US dollar. The onset of great recession in October of 2008 had caused depreciation of the TL somewhat, yet well short of maintaining its real level of January, 1982 ([Yeldan 2011](#)).

It ought to be noted as well that, the determination of employment effects not only the level, but also the volatility of the exchange rate matters. The potential negative effects of exchange rate volatility are well known in the literature (see e.g. [Andersen and Sorensen 1988](#); [Belke and Kaas 2004](#)) and are succinctly documented in the Turkish context in [Demir \(2010, 2013\)](#). In what follows, [Belke and Gocke \(2004\)](#) further studied the adverse effects of the revenue uncertainties on employment as generated by exchange rate volatilities and accompanied current account balances in the context of a formal model of risk-neutral firms facing sunk hiring and firing costs. In fact, the volatility and the appreciation of currency together would necessarily result in adverse balance sheet effects via the expectations channel. This is mostly due to the threat of expected depreciation in the face of a widening current account deficit. [Frenkel and Ros \(2006\)](#) report of a

statistically significant negative effect of currency appreciation on employment growth in their study of the 17 Latin American economies; while [Riberio et al. \(2004\)](#) documents the negative employment effects of real exchange rate appreciation in Brazil. Similarly, [Galindo, Izquierdo, and Montero \(2007\)](#) show that, in response to worsening external balances, the warranted currency depreciations are likely to generate negative employment effects in regimes of high liability dollarization.

With a more balanced macroeconomic environment, the Scenario 2 achieves an increase in the real rate of growth of GDP by 0.1–0.2%, and leads to an expansion of the real GDP by an additional 20 billion TRY (in fixed 2008 prices). More detailed assessments reveal that the main source of this outcome lies with the expansion of export demand. Under the scenario the GDP share of exports increase from 16.7% in 2013 (historical realization) to 20.3%. This gain is mostly due to the stimulus generated via real exchange rate depreciation. The scenario results further reveal that as a result of increased savings funds, investment expenditures expand by 1 over their 2013 historical value. In this fashion, capital accumulation is intensified and increases the marginal productivity of labor to serve as the main catalyst in the rise of employment.

5.3. Selective employment subsidization that favor industrial employment: Scenario 3

Our analysis thus far has treated the subsidization incentives as ‘neutral’ across sectors. The fact that the results to the program were rather ‘dismal’ leads us to question whether implementation of the subsidy program in a more selective fashion favoring labor-intensive industry would produce better outcomes. Thus rather than implementing a signal rate with neutral incentivization over all of the sectors in entirety, I introduce a pre-industrial employment subsidy scheme under Scenario 3, and parametrically increase the subsidy rate for the industrial sectors by twofolds.

The first panel of Table 6 summarizes the results of this exercise. It is found that the additional (industrial) subsidies led to an additional gain in industrial employment by 24 thousands in 2009, 29 thousands in 2010, and 53 thousands in 2011. By 2013 unemployment rate falls by about 0.2 percentage points, and a net expansion of 4 billion TRY (in fixed 2008 prices) is achieved in real GDP.

In returns to a 1.5 billion TRY additional subsidy, the fact that the industry has created additional jobs of only 53 thousands as of 2013, indicate that the employment generation capacity of the sector is quite limited. This meager performance should ultimately be tied with the rather low productivity of the industrial sectors. It is this issue I now turn upon.

5.4. The case of the productivity decline: Scenario 4

The post-2001 Turkey had been an economy of boom and bust. Rapid expansions in output (2004–2005; 2010–2011) were followed by slowdowns (2006–2008; 2012–2013) and severe contractions (2009). This cycle was driven mostly by the availability of short-term foreign capital inflows and ultimately found its disposal in the rate of TFP growth. Recent studies on TFP estimation ([Gursel and Soybilgen 2013](#); [Kolsuz and Erinc Yeldan 2014](#) and [Yeldan et al. 2013](#)) disclose that Turkey has attained fairly rapid TFP growth between 2002 and 2006, and yet it virtually stagnated following 2006. The global crisis has fallen over this

Table 6. Macroeconomic Results, Scenarios 3 and 4.

	Historically realized path										Scenario 3: Additional subsidies to industry					Scenario 4: Scenario 2 + if productivity gains were maintained						
	2008	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013	
<i>Macroeconomic results</i>																						
Real GDP (bill TRL, 2008 prices)	950.5	903.5	983.3	1,058.6	1,079.7	1,120.8	904.1	984.4	1,060.3	1,082.2	1,124.0	903.5	985.3	1,074.6	1,198.9	1,253.9	903.5	985.3	1,074.6	1,198.9	1,253.9	
Real GDP growth rate	-0.050	0.088	0.077	0.020	0.038	-	0.089	0.077	0.021	0.039	-0.050	0.091	0.091	0.116	0.049	0.086	0.091	0.091	0.116	0.049	0.086	
Consumption share in GDP	0.828	0.851	0.846	0.838	0.829	0.835	0.851	0.846	0.838	0.829	0.835	0.851	0.846	0.838	0.829	0.835	0.851	0.846	0.838	0.829	0.835	
Investment share in GDP	0.216	0.149	0.195	0.235	0.201	0.206	0.149	0.195	0.235	0.201	0.206	0.149	0.204	0.224	0.216	0.216	0.149	0.204	0.224	0.216	0.216	
Private savings ratio to GDP	0.151	0.133	0.117	0.101	0.111	0.103	0.133	0.117	0.101	0.111	0.103	0.133	0.165	0.163	0.163	0.163	0.133	0.165	0.163	0.163	0.163	
Public savings ratio to GDP	0.027	-0.008	0.015	0.037	0.029	0.029	-0.008	0.015	0.037	0.029	0.029	-0.008	0.015	0.037	0.029	0.029	-0.008	0.015	0.037	0.029	0.029	
Current account deficit ratio	0.038	0.024	0.063	0.097	0.061	0.074	0.024	0.063	0.097	0.061	0.074	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	
Foreign debt stock ratio to GDP	0.296	0.363	0.343	0.367	0.472	0.506	0.362	0.343	0.366	0.470	0.504	0.363	0.356	0.348	0.331	0.338	0.363	0.356	0.348	0.331	0.338	
Foreign debt interest payments ratio to GDP	0.019	0.024	0.022	0.024	0.031	0.033	0.024	0.022	0.024	0.031	0.033	0.024	0.023	0.023	0.022	0.022	0.024	0.023	0.023	0.022	0.022	
Imports ratio to GDP	0.263	0.242	0.253	0.264	0.255	0.256	0.242	0.253	0.264	0.254	0.256	0.242	0.255	0.261	0.258	0.258	0.242	0.255	0.261	0.258	0.258	
Exports ratio to GDP	0.172	0.186	0.165	0.150	0.175	0.167	0.187	0.165	0.150	0.175	0.168	0.186	0.199	0.205	0.201	0.202	0.186	0.199	0.205	0.201	0.202	
<i>Labor market results</i>																						
Unemployed (1000 persons)	2,611.0	3,471.0	3,046.0	2,615.0	2,518.0	2,747.0	3,446.3	3,012.3	2,568.7	2,456.8	2,672.4	3,471.0	2,942.7	2,350.7	1,774.2	1,632.5	3,471.0	2,942.7	2,350.7	1,774.2	1,632.5	
Unemployment rate	0.110	0.140	0.119	0.098	0.092	0.097	0.139	0.117	0.096	0.090	0.095	0.140	0.115	0.088	0.065	0.058	0.140	0.115	0.088	0.065	0.058	
Total employment (1000 persons)	21,193.6	21,277.4	22,594.3	24,110.5	24,820.8	25,523.6	21,302.1	22,627.9	24,156.8	24,881.9	25,598.3	21,277.4	22,697.5	24,374.8	25,564.6	26,638.1	21,277.4	22,697.5	24,374.8	25,564.6	26,638.1	
Agriculture total employment	5,016.2	5,141.8	5,244.7	5,446.7	5,281.6	5,174.6	5,143.5	5,246.5	5,448.9	5,284.1	5,177.2	5,141.8	5,112.5	5,311.4	5,137.4	5,031.3	5,141.8	5,112.5	5,311.4	5,137.4	5,031.3	
Industry total employment	4,400.2	4,222.4	4,519.6	4,893.7	5,230.5	5,431.4	4,246.2	4,548.7	4,930.2	5,276.5	5,483.9	4,222.4	4,814.6	5,356.2	5,709.7	6,073.8	4,222.4	4,814.6	5,356.2	5,709.7	6,073.8	
Construction total employment	1,242.2	905.9	1,217.8	1,525.9	1,355.7	1,415.5	907.0	1,219.2	1,528.0	1,358.2	1,418.4	905.9	1,280.1	1,487.9	1,491.0	1,540.6	905.9	1,280.1	1,487.9	1,491.0	1,540.6	
Services total employment	10,534.9	11,007.3	11,612.3	12,244.2	12,953.0	13,502.2	11,005.4	11,613.5	12,249.7	12,963.2	13,518.7	11,007.3	11,490.3	12,219.3	13,226.4	13,992.5	11,007.3	11,490.3	12,219.3	13,226.4	13,992.5	
Total formal employment (1000 persons)	10,422.9	10,305.4	11,127.6	12,103.0	13,190.8	14,095.5	10,330.0	11,161.3	12,149.2	13,252.0	14,170.1	10,305.4	11,230.8	12,367.3	13,934.7	15,210.0	10,305.4	11,230.8	12,367.3	13,934.7	15,210.0	
Agriculture formal lab. emp	74.6	72.4	76.1	82.9	88.8	94.4	72.5	76.2	83.0	89.1	94.7	72.4	73.4	80.2	89.5	96.8	72.4	73.4	80.2	89.5	96.8	
Industry formal lab. emp	3,189.5	3,022.3	3,253.4	3,563.8	3,915.7	4,149.2	3,046.0	3,282.5	3,600.5	3,961.7	4,202.0	3,022.3	3,443.8	3,881.9	4,300.6	4,686.6	3,022.3	3,443.8	3,881.9	4,300.6	4,686.6	
Construction formal lab. emp	496.3	349.9	479.2	617.9	582.6	637.2	350.5	480.1	619.4	584.4	639.6	349.9	500.3	599.9	653.7	714.0	349.9	500.3	599.9	653.7	714.0	
Services formal lab. emp	6,662.5	6,860.8	7,318.9	7,838.3	8,603.8	9,214.6	6,861.1	7,322.4	7,846.3	8,616.8	9,233.8	6,860.8	7,213.3	7,805.3	8,890.9	9,712.6	6,860.8	7,213.3	7,805.3	8,890.9	9,712.6	
Formal labor share	0.492	0.484	0.492	0.502	0.531	0.552	0.485	0.493	0.503	0.533	0.554	0.484	0.495	0.507	0.545	0.571	0.484	0.495	0.507	0.545	0.571	
Agriculture formal lab. share	0.015	0.014	0.015	0.015	0.017	0.018	0.014	0.015	0.015	0.017	0.018	0.014	0.014	0.015	0.017	0.019	0.014	0.014	0.015	0.017	0.019	
Industry formal lab. share	0.725	0.716	0.720	0.728	0.749	0.764	0.717	0.722	0.730	0.751	0.766	0.717	0.725	0.730	0.753	0.772	0.717	0.725	0.730	0.753	0.772	
Construction formal lab. share	0.400	0.386	0.394	0.405	0.430	0.450	0.386	0.394	0.405	0.430	0.451	0.386	0.391	0.403	0.438	0.463	0.386	0.391	0.403	0.438	0.463	
Services formal lab. share	0.632	0.623	0.630	0.640	0.664	0.682	0.623	0.631	0.641	0.665	0.683	0.623	0.628	0.639	0.672	0.694	0.623	0.628	0.639	0.672	0.694	
Subsidy costs as share of public revenues	0.000	0.014	0.014	0.015	0.018	0.017	0.017	0.018	0.019	0.022	0.022	0.014	0.014	0.015	0.016	0.016	0.014	0.014	0.015	0.016	0.016	
Subsidy costs as share of GDP	0.000	0.004	0.004	0.005	0.005	0.005	0.005	0.005	0.006	0.007	0.006	0.004	0.004	0.005	0.005	0.005	0.004	0.004	0.005	0.005	0.005	

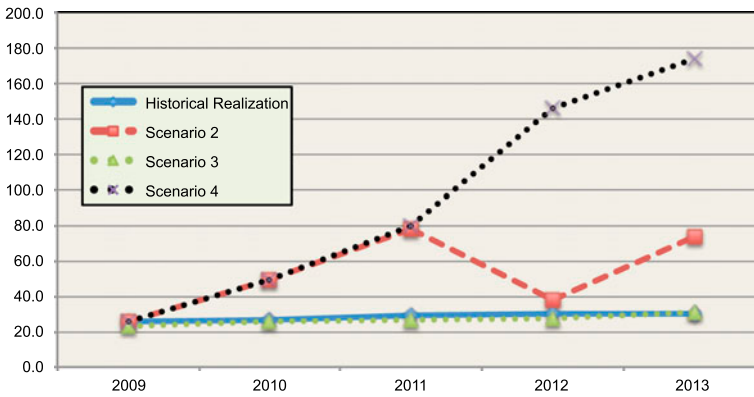


Figure 17. Employment elasticity of the subsidization program under alternative scenarios (1000 persons/billion TRL).

decline in 2009 leading to a collapse of real output by 4.8%. Even though the GDP recovered in 2010 and 2011, the economy failed to generate a sustained expansion in output driven by productivity gains. Based on these observations, many researchers argued that Turkey has been struggling with the constraints of the *middle income trap*, a concept that has been introduced in [Eichengreen, Park, and Sin \(2011\)](#).

Given our emphasis on the importance of maintaining the structural macroeconomic fundamentals over the analyzed period, it would not be implausible to expect that an export-oriented growth path with a balanced external account could produce a more conducive environment for technological change and innovation. The links between dynamic gains from innovation and technological change and a stable and competitive macroeconomic environment is one of the key hypotheses of the new growth literature. Thus, I would like to pursue this route by hypothesizing that the favorable conjuncture as outlined in Scenario 2 above could have been complemented with TFP gains at the rate as observed in Turkey over 2002–2006. Increased exports expanded capital investments leading to increased productivity gains in labor are well expected to generate further gains in total productivity creating a virtuous cycle of sustained growth. This favorable (but quite realistic) expectation is what we simulate under Scenario 4.

Under these hypotheses, the scenario takes the balanced macroeconomic environment of Scenario 2 and complements it with added gains in TFP at a rate of 0.5% after 2010. Given the historical and simulated paths of the TFP over the 2000s as displayed in [Figure 3](#) above, the warranted rate of TFP growth ascribed in Scenario 4 should be regarded ‘modest’. In fact, the *Medium Term Program* of the Ministry of Development sets the expected TFP growth at 1% over 2014–2017; while the [World Bank \(2014\)](#) Report on Turkey assumes that the TFP growth would average 0.8% over the rest of the 2010s.

The scenario results are tabulated in the second half of [Table 6](#). The results are, not surprisingly, quite favorable. Within a balanced macroeconomic policy environment supported by productivity advances, economic activity is invigorated. GDP growth accelerates to above 7% on average, and with the imposition of the subsidy package at the rate granted in historical magnitudes, achieves an expansion of employment by 1 million 400 thousands, bringing the unemployment rate to below 6% in 2013 (back to the 2000 level).

The fact that even a modest set of productivity gain of about half of what is hypothesized in the official documents could achieve such a strong and robust outcome, leads us to underline once again the importance of structural macroeconomic fundamentals.

6. Conclusion and policy implications

In this study, I investigated the impact of the employment subsidies that Turkey had introduced against the 2009 global crisis and the ongoing great recession. To this end, an applied general equilibrium model was utilized to study the effects of the subsidy package on the labor markets as well as overall macroeconomic aggregates and sectorial resource allocation. The employment subsidization program was implemented via nine different schemes. Data reveal that its fiscal costs averaged 0.9% per annum as a ratio to the GDP.

Counter-factual simulations of the analytical model indicate that the subsidization program lead to an expansion of employment by 90 thousands in 2009, reaching to 230 thousands in 2013. The employment gains were associated with an expansion of the real GDP by 8.1 billion TRY in fixed 2008 prices (with an additional 0.1% gain of real rate of growth). On historical and across-country generalizations, this is evaluated as a meager performance. I argued that this was due to the dis-equilibrating and fragile macroeconomic environment surrounding the national economy. It is observed that, with its deteriorating external balances and fragility, and the increased burden of interest on its burgeoning foreign debt, Turkey had been trapped within the darkening conditions of the global great recession. As a further complement of this deteriorating macro environment, Turkey had increasingly suffered from a decline in its rate of productivity growth. Following 2006, TFP rates had virtually stagnated and Turkey entered an era of volatile growth often dictated by the availability of short term foreign finance capital. Against this background, the need for administration of a stable and competitive real exchange rate policy and re-invigoration of the domestic savings effort to maintain external balances are observed to be the *sine qua nons* of the sustained growth for Turkey.

Based on these observations, my next research question was to ask, ‘what would be the effectiveness of the existing subsidization program in an environment characterized by more balanced macroeconomic conditions?’ Our simulations reveal that under such a policy environment, the subsidy packages would enable an expansion of labor employment by about threefolds to 568 thousands in 2013, with a decline of the unemployment rate to 8.5% (rather than 9.7%).

Finally, the modeling exercise introduced the positive role of enhanced productivity gains. Under a new scenario, the balanced macroeconomic environment is further complemented with the hypothesis that Turkey could have maintained its historical productivity gains (as was realized over 2002–2006) from 2011-onwards. Assuming a modest rate of 0.5% TFP growth over a stable macroeconomic environment enabled employment gains of 1.4 million workers and the acceleration of GDP growth to 7% in returns to the subsidy program.

All these observations are summarized succinctly in Figure 17 below. The figure portrays the marginal gain in employment due to an additional 1 billion TRY subsidy expenditure. This *employment elasticity of subsidization* reveals that by 2013 the program has generated an additional employment of 29,766 workers per 1 billion TRY (in fixed 2008 prices). Per contra, if the same policy package were introduced under a more balanced macroeconomic

environment, this elasticity would have been 73,170 workers. With the complementarities hypothesized to be achieved from further productivity gains, this number could have been increased to as much as 173,564 workers in the same year. Clearly, Turkey has been missing an important opportunity against its otherwise quite generous employment support program.

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Appendix 1. The data set

The model is built-around a multi-sectoral social accounting matrix (SAM) of the Turkish economy based on the Turkish Statistical Institute (TurkStat) 2002 Input Output Data. The 2002 I-O data had been updated to 2008 using the national income statistics. The SAM data is further tabulated from various other sources from the Ministry of Finance to obtain the fiscal flow data, and from the Central Bank of TR to deduce statistics on balance of payments.

Sectoral employment is taken from TurkStat. Household Labor Force Surveys (HLFS) give employment levels in detailed sectoral aggregation. This data is complemented by wage share data of the [International Labor Organization \(2014\)](#) and were corrected for using the self-reported household incomes as reported in the HLFS. Data on domestic and foreign debt and foreign trade data are calculated from the balance of payments statistics of the TR Central Bank. All exogenous flows of foreign capital and remittances are lumped under one item as net transfers to the private household. (6.5% of the 2008 GDP).

The 2008 I/O Table and the Social Accounting Matrix are tabulated in the Appendix as Tables A1 and A2 (Supplemental material). Sectoral employment data by labor types is summarized in the Appendix Table A3 (Supplemental material). These data and the algebraic system of the model are available from the author upon request.