Market Institutions, Labor Market Dynamics, Growth and Productivity: Argentina

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Abstract

This paper seeks to shed light on how manufacturing job flows and productivity in Argentina were affected during the 1990s by economic reforms in general and particularly by: a) financial shocks, b) labor reforms that change non-wage labor costs, c) trade reforms that alter tariff dispersion, d) institutional features that affect the working of the credit, labor and goods markets. To this end, a "Constrained Panel Data Near Vector Autoregression" analysis is applied to a sample of 20 manufacturing industries for which data on jobs and productivity are available for the 1990-2001 period on a quarterly basis and different tests for the effect of reforms on job flows and productivity are performed. The main findings are that:

- Shocks to the user cost of capital lower job creation, net employment growth and productivity and raise destruction. Increases in non-wage labor costs lead to bigger job destruction and reallocation and to smaller net employment and productivity. Lower sectoral tariffs raise job destruction, reallocation and productivity and reduce net employment growth.

- Industries with bigger access to banking credit are more hard hit by financial shocks, but are are able to raise more their net employment growths in response to reductions in non-wage labor costs and sectoral tariff hikes. The presence of workers with larger bargaining power leads to bigger declines in job creation, net employment growth and job reallocation in response to negative profitability shocks. More open industries restructure more and experience smaller productivity declines in response to negative profitability shocks. These sectors raise net employment growth more when non-wage labor costs are reduced.

- Increased reallocation within the manufacturing sector as a whole is seen to contribute to bigger increases (or smaller declines) in productivity in response to the different shocks. Although a majority of industries also display a positive contribution of reallocation to productivity in response to most shocks, there is substantial heterogeneity of behavior at this level.

- The reforms in the areas of trade policy (formation of Mercosur) and labor taxes and regulations (lower taxation and more flexibility) after 1995, together with the increased reliance on banking credit, changed the nature of the responses of job flows to the different policy and cyclical shocks.

- During 1995-2001 destruction rises more in response to negative profitability shocks, reflecting the more flexible labor regulations. This bigger labor market flexibility also appears to have led to a bigger synchronization of creation and destruction in response to non-wage labor shocks. The bigger reliance on banking credit and the bigger sensitivity to losses of international competitiveness due to Mercosur made net employment growth and reallocation decline more in response to adverse shocks to the cost of capital.

1 Introduction

This paper seeks to unveil the links between gross and net job flows, both at the aggregate and sectoral levels, policy reforms and manufacturing productivity dynamics in Argentina during the 1990s.

A key finding in the literature on the determinants of manufacturing productivity growth in developed countries is that much or most of this growth process is accounted for by the continuous reshuffling of labor from technologically backward production units to the technologically advanced ones (Caballero and Hammour, 1996). What is more, a large share of this job reallocation takes place at an intra-sectoral level (Davis, Haltiwanger and Shuh, 1996). While it has been found that the process of job reallocation in developing countries has been no less significant (Tybout, 2000), the contribution of this creative-destructive process to productivity growth in these countries remains to be empirically examined. Caballero and Hammour (1996, 2000) propose, at a theoretical level, that the presence of excessively strong workers, large sunk costs in job creation and institutional weaknesses, should lead to destruction-driven recessions and to technological sclerosis in these countries, but this proposition has not been empirically tested.

Argentina offers a unique opportunity to inquire into these issues. The 90s were land marked by deep structural reforms, which totally changed the structure of the economy. Macroeconomic stabilization, deregulation, privatization, labor market reforms and trade and capital account liberalization changed the rules of the game. These reforms led to dramatic changes in the economic structure, the choice of production techniques, the reallocation of factors both within and across sectors, and in the determinants of cyclical fluctuations.

This paper will concentrate on specifically shedding light on the following questions. First, how manufacturing job flows and productivity growth in Argentina were affected during the 1990s by: a) financial shocks, b) labor reforms that change non-wage labor costs, c) trade reforms that alter tariff dispersion, d) institutional features that affect the working of the credit, labor and goods markets. Second, what is the connection between reallocation and productivity, and how much of the effect of policy shocks on productivity arises from their effect on reallocation. Finally, whether the nature of the responses of job flows and productivity growth to the different policy and cyclical shocks changed over time as a result of structural reforms in general.

To answer the proposed questions, the paper starts by applying a "Constrained Panel Data Near Vector Autoregression" analysis to a sample of 2619 firms that were aggregated to 20 2-digit ISIC manufacturing industries for which data on jobs and labor productivity are available for the 1990-2001 period on a quarterly basis. The estimated impulse-response functions are then used to appraise the effect on gross and net job flows and productivity of shocks to the user cost of capital, non-wage labor costs and sectoral import tariffs. To evaluate the role played by the policy environment, the cumulative impulse responses of job flows and productivity are regressed on vectors of sectoral characteristics that include institutional features such as sectoral access to credit, workers' strength and the trade exposure and orientation.

In order to appraise what share of the response of productivity to the different shocks is due to the induced changes in reallocation, we estimate the impulse-responses of productivity to the different shocks when the response of job flows is shut-off in the way proposed by Bernanke, Gertler and Watson (1995) and Sims and Zha (1996) and compare them to the impulse response-functions of productivity that obtained in the baseline case. Finally, to check whether structural reforms in general caused changes in the responses of flows and productivity to the different shocks we first do simple comparisons and correlation analysis of the behavior over time of the different job flow and productivity growth statistics for different sectoral classifications and then proceed to performing tests for structural breaks on the VAR coefficients.

The main findings are that:

- Shocks to the user cost of capital lower job creation, net employment growth and productivity and raise destruction. Increases in non-wage labor costs lead to bigger job destruction and reallocation and to smaller net employment and productivity. Lower sectoral tariffs raise job destruction, reallocation and productivity and reduce net employment growth.

- Industries with bigger access to banking credit are more hard hit by financial shocks, but are are able to raise more their net employment growths in response to reductions

in non-wage labor costs and sectoral tariff hikes. The presence of workers with larger bargaining power leads to bigger declines in job creation, net employment growth and job reallocation in response to negative profitability shocks. More open industries restructure more and experience smaller productivity declines in response to negative profitability shocks. These sectors raise net employment growth more when non-wage labor costs are reduced.

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- The reforms in the areas of trade policy (formation of Mercosur) and labor taxes and regulations (lower taxation and more flexibility) after 1995, together with the increased reliance on banking credit, changed the nature of the responses of job flows to the different policy and cyclical shocks. During 1995-2001 destruction rises more in response to negative profitability shocks, reflecting the more flexible labor regulations. This bigger labor market flexibility also appears to have led to a bigger synchronization of creation and destruction in response to non-wage labor shocks. The bigger reliance on banking credit and the bigger sensitivity to losses of international competitiveness due to Mercosur made net employment growth and reallocation decline more in response to adverse shocks to the cost of capital.

Section 2 presents the description of the data. The analytical framework is outlined in Section 3. The VAR analysis is undertaken in Section 4. Section 5 analyzes the sectoral job flows and productivity dynamics. The role of sectoral characteristics is explored in Section 6.

The effects of shocks on productivity via their impacts on reallocation are studied in Section 7. Section 8 presents the analysis of whether reforms in general led to changes in the responses of job flows to the different shocks. Section 9 concludes.

2 Data description

2.1 Measurement and basic facts: Gross and Sectoral Job Flows and Productivity

2.1.1 Gross and Sectoral Job Flows

Data on sectoral job flows and productivity for the Manufacturing sector are from the Monthly Industrial Survey (MIS) carried out by INDEC.[1] The reference universe consists of firms employing more than 10 staff and covers all the activities of the manufacturing sector. The data provided by INDEC covers the period 1990-2001. The frequency of the data is quarterly, with 48 periods available.[2][3] Here we summarize the features of the data that are more relevant for the present study. For simplicity, we use the annual growth rates of job flows and productivity to illustrate the stylized facts for the manufacturing sector.

The data for the 1990-2001 period show a net destruction tendency together with modest rates of job creation (see Table 1). The annual job creation rate exceeded 8% only in IV.1992 and in II.1998, while it stabilized between 4 and 6%, with a median of 5%, during the remainder of the period. Annual job destruction rates were moderate but had a 7% floor, except during 1997 when this rate reached 5,3%. Therefore the net growth of employment is negative in almost all of the period (with the exception of some quarters in 1997/1998), leading to a cumulative reduction in industrial employment of almost 40% for the whole

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[1] Detailed information regarding this data base and the tabulations that we make are available in a companion paper (see Butler, Ruffo and Sánchez, 2002).

[2] There is a change in the methodology in 1997. The mapping between the two methodologies was done by INDEC and improved by us. The sample is cleared up by dropping the firms for which the mapping between the two methodologies in 1997 was deemed to remain unsatisfactory even after the INDEC's original mapping were improved by us. After corrections, data base includes information of 2.635 firms: 416 of which have complete data for the I.1990-IV.2001 period, and 1849 with complete data between I.1997-IV.2001.

3 The data reflect firm-level changes in the average number of employees and in the average labor productivity between subsequent quarters. Employment variables are expressed as growth rates with respect to the average for each pair of subsequent quarters and producticity variables as growth rates vis-à-vis the previous quarter. Seasonality is removed by applying an ARIMA X-11 method.

period.[45] The behavior over time of the aggregate gross and net job flows is shown in Figure 1. The evidence points towards frequent significative fluctuations in these flows.

The available evidence suggests that the Argentine economy was subject to both aggregate and allocative disturbances throughout this period, with different degrees of incidence on realloaction at different times. On the other hand, idyosincratic effects are seen to explain from 40 to 66% of the observed job reallocation throughout the entire period (see Figure 2).

The behavior of gross and net job flows by industry (defined at two digit ISIC rev. 3) is similar to the aggregate behavior, with low rates of creation and moderate rates of destruction and reallocation, albeit with an important degree of heterogeneity regarding the dispersion of job flows.[6] Grouping firms by initial size, we observe that the larger the firm, the lower the gross job flows (see Table 2).[78]

Labor productivity grew at a 6,5% annual rate for the manufacturing sector during 1990-2001 (see Figure 3). This positive trend was disrupted in the periods of contraction in manufacturing output (some quarters of 1995, 1999 and 2001). This behavior of productivity is common to all sectors and classifications. It is also worth noticing that the peaks and troughs in aggregate manufacturing labor productivity growth respectively coincided with the troughs

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[4] Due to the disincentive that firms have to inform on the use of informal labor, the MIS statistics refer mostly to formal job flows. The comparison to other sources of data on formal jobs, like the Labor Indicators Survey of the Ministry of Labor and the Integrated Systems of Pensions, shows that the MIS data are highly representative of the dynamics of formal jobs. However, the manufacturing employment level obtained from the Permanent Household Survey, which includes both formal and informal workers, suggests that total manufacturing employment declined only 20% during the period under consideration. This implies that during this period there was a transformation of formal jobs into informal jobs that dampened the total net destruction of jobs in manufactures.

[5] The data base we are using surveys only establishments with more than 10 employees, which additionally are mostly continuers. The exclusion of smaller establishments, of entries and exits and of one-year establishments significantly lower our estimates of reallocation rates. Using register data from the Integrated System of Pensions, Castillo et al (2001), estimate the average 1995-2000 reallocation rates to be 24.5%. Average creation and destruction rates respectively were 11.1% and 13.4%, with entries and exits contributing to about one third of these gross job flows. Finally, firms with less than ten employees had a 49.6% reallocation rate on average.

[6] Reallocation rates ranged from 11.6% for *Chemicals and Chemical Products* to 24.6% for *Other Transportation Equipment*. *Coke, refined petroleum products and nuclear fuel* has the lowest creation rate which, combined with a high destruction rate, especially in the period 91-95, generated the most negative net flow (-11.7 in the whole period). *Publishing, printing and reproduction of recorded media* was the only sector with a positive average net employment growth rate: 0.5%.

[7] Job creation and job destruction are 1.9 and 1.4 points higher than the aggregate ones in firms with less than 50 employees, while in firms with more than 300 employees these gross flows respectively are 1.5 and 0.9 percentage points lower than the aggregate rates.

[8] The differences in the degree of openness did not seem to introduce a big heterogeneity in sectoral job flows. Differences in export shares do not seem to be related to any particular pattern of gross and net job flows. High import penetration industries suffered the highest job destruction and the lowest job creation rates but the differences between their net growth rates and the aggregate ones were below one percentage point.

and peaks in net employment growth between 1991 and 1995, while the opposite happened between 1996 and 2001.[9]

Sectoral classification by industry shows that a wide dispersion in productivity growth rates.[10] The establishments in industries with high exposure to trade, especially the ones facing bigger import penetration, experience the highest productivity growth in 1991 (14.6%), 1992 (19.1%) and in 1996 (25%).[11] There is not a clearcut pattern in the association between initial size and productivity growth.[12]

2.2 Terms of trade, user cost of capital, tariffs, non-wage labor costs, and labor market distortions

2.2.1. Terms of trade

Terms of trade is an index elaborated by INDEC that reflects the behavior of the price of exports relative to the price of imports. The behavior of this variable is determined by prices in international markets (Argentina is a small economy mostly especialized in commodities, processed agricultural goods and homogeneous industrial goods), and by the composition of its exports and imports, and it is mostly driven by the fluctuations in the world prices of agricultural commodities and oil and oil products, which make up most of Argentine exports (see Figure 4).

2.2.2. The user cost of capital

The user cost of capital was computed as suggested by Hall and Jorgensen (1967): $r(t) = P^k(t)(R(t) + \delta(t))$, where $R^K(t)$ is the real interest rate at time t. $P^K(t)$ is the price of capital at

[9]This implies that during the first period labor productivity may have varied cyclically due to adjustment costs and/or variation in factor utilization rates. Instead, the comovement between net employment growth and productivity during the second period suggests that periods of fast output growth, like 1997-1998, were accompanied of high investment or TFP growth, while contractionary periods displayed reductions of investment and TFP.

[10] These rates ranged from 0,9% for *Medical, optical and precision instruments* to 16.1% for *Radio, television and communication equipment*. The largest productivity gains are concentrated in the 1991-94 sub-period. Among the industries with the most rapid gains of productivity features *Coke, refined petroleum products and nuclear fuel* sectors, especially in the first years (1991-1992). Recall that this last industry also presented the lowest creation rate, a high destruction rate, especially in the period 91-95, and the most negative net flow for the whole period.

[11] This behavior of productivity coincides in the first two years with the 50% average tariff slash of 1991, while in 1996 it coincides with the onset of Mercosur.

[12] The only discernible pattern is that the smallest firms (less than 50 employees) have average productivity growth rates of 1.4% for the whole period that are much smaller than the aggregate ones (6.5%), while the opposite is verified for the largest firms (more than 300 employees), the labor productivity of which grew at a 10.9% average annual rate.

time t.[13] δ is the depreciation rate, constructed as a weighted average of capital specific depreciation rate.[14] The sources of the interest rates are publications from the Argentine Central Bank and the Ministry of Economy, and our own data bases. The sources of prices are INDEC and our own data bases.

The behavior of this variable over time depends on the evolution of the nominal interest rate, which under the functioning of the Currency Board depended in turn on external developments (such as a fall in interest rates in the U.S.) and on domestic news (such as a very large fiscal deficit) that have an effect on foreign capital flows and the country risk-premium. These rates were also a function of changes in domestic financial regulations such as minimum reserve requirements. The cost of capital additionally depended on the evolution of domestic inflation and on the price of capital goods, which in Argentina are largely imported and are thus affected by trade liberalization and by exchange rate fluctuations in non-U.S. trading partners.[15] The behavior of this variable over the sample period is displayed in Figure 5. One noticeable feature is that peaks in the cost of capital usually preceded significant drops in net employment growth.[16]

2.2.3. Non-wage labor costs

We construct a variable that seeks to capture the effects of regulations and taxes that introduce a wedge between wages and labor costs, discouraging the use of formal labor in production. Following Mondino and Montoya (1998), our measure of non-wage labor costs embedded in labor regulations and taxes is defined as the sum of labor taxes and expected

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[13] This price is constructed as constructed as a weighted average of different kind of capital prices, where weights were constructed using the capital intensity from the Input – Output tables from 1997 and from the Economic Census 1994.

[14] The weights were constructed using the capital intensity from the Input – Output tables from 1997 and from the Economic Census 1994. The main drawback with this methodology is that the weights are constant all over the period.

[15] Under the Currency Board, inflation was mostly affected by: a) the fluctuations of the exchange rates of the U.S. dollar vis-à-vis the major trading currencies and of the Brazilian currency vis-à-vis the U.S. dollar, that had nominal impacts on the prices of tradable goods, and b) the fluctuations in capital flows and in aggregate demand, which pushed up the prices of non-traded goods at expansionary times and depressed them during recessions.

[16] The user cost of capital declined sharply during 1991-1992 as a result of the succesful and credible stabilization based on the introduction of the Currency Board, which was accompanied by sizable capital inflows that significantly reduced interest rates. The prices of capital goods fell significantly as a result of the exchange rate stabilization and of the first wave of trade liberalization. In 1993 there was a credibility crisis that led to a run against the peso and to a surge of capital outflows that pushed interest rates up. The second peak in the cost of capital was caused by capital flight and the banking crisis associated to the Tequila crisis. The post-Tequila financial stabilization led to renewed capital inflows that, along with inflation of non-tradable goods prices, pushed nominal interest rates down. This stage lasted until the end of 1997. During 1998-2001, the combination of capital outflows, recession and the devaluation of the Brazilian currency resulted in domestic deflation and mounting interest rates. Additionally, the mounting doubts about the ability of Argentina to serve its foreign debt led to a rising country-risk premium and to vicious circle of high interest rates-low competitiveness-recession-high country risk and so on.

severance payments. Labor taxes include pension funds, family allowances, and contributions to the health care system.[17] Expected severance payment (*ESP*) is calculated as the percentage of monthly wage due to severance payment (1/12= 8,33%) multiplied by the average tenure of the working population, corrected by the probability that the worker will be entitled to receive a severance payment.[18] The data sources are INDEC and the Population Census for the regional population data, the EPH (Permanent Household Survey) and INDEC for employment, and the Labor Laws and decrees and resolutions that modify tax rates during the period for this latter variable.

This synthetic measure seeks to capture the negative profitability component of shocks to non-wage labor costs that impact on the creation and destruction decisions of firms. This is why we include the *expected* severance payments. The actual mandatory severance payments displayed relatively little changes and most of the variation of non-wage labor costs resulted from the variation in labor taxes and in the probability of firing.[19]

The evolution of this variable over the sample period is shown in Figure 6.[20] A visual inspection of the time series for gross job flows and the NWLC shows that the declines in these costs in 1994 and in 1996 were associated to a rise in net employment growth, while the cost hikes in 1995 and in 2001 were correlated with a drop in net employment growth.[21]

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[17] Tax rates vary by region. In order to obtain the tax rate for the whole country, an employement weighted average was calculated.

[18] The final percentage was obtained through the following formula: $ESP_t = 0.0833 * T_t * F_t * P_t$, where T is the average tenure in months computed for severance payment, according to the legislation of the period, F is the percentage of fired formal workers over formal employment (both formal and informal), P represents the share formal employment on total manufacturing employment and t refers to time (quarter).

[19] We admit that changes in mandatory severance payments will have qualitatively different effects on reallocation than the profitability shocks arising from changes in non-wage labor costs. We will explore these effects when conducting tests for structural breaks in the structural VAR coefficients and characterizing the different sub-periods by the prevailing labor market regulations and nature of labor contracts.

[20] These costs were rather large between 1991 and 1994, mostly due to large labor taxes, especially the contributions to social security (which represented 11% of formal wages). Non-wage labor costs declined significantly towards 1994 thanks to big drops in the contributions to Social Security in 1994 (they were reduced to a 5% rate of formal wages). These tax cuts were partially reversed in 1995 which, together with the rise in firing intensity associated to the Tequila, pushed NWLC back up. During 1996 labor taxes were reduced again (to levels 40% below the pre-1994 ones and 27% below the 1995 ones) and the same happened to firing intensity, which lowered the NWLC again. The 1996-1998 behavior was characterized by constant labor taxes and a reduction in the minimum severance payment in 1998. The 1999-2001 sub-period displayed drops in the contributions to Social Security that pushed these costs slightly down in 1999 and 2000, but this effect was outweighed by the steady increases in firing intensity, that accelerated in 2001.

[21] The question of the direction of causality, i.e., that rises in NWLC are due to increases in firing intensity, becomes an issue only in 2001. Controlling for this endogenous component of NWLC will be an important guide for the setting of the causal ordering in our structural Vector Autoregression Analysis, which is presented in Section 5.

2.2.4 Tariffs

Sectoral and average effective nominal import tariffs were obtained from disaggregate data, at 5 digits, ISIC Rev 2[22]. The aggregation process to 2 digit classification was done by computing the simple average of tariffs from 5 digit classification. Following the onset of Mercosur in 1995, tariffs are trade-weighted averages of intra-zone tariffs (which are zero in most cases) and Mercosur's Common External Tariffs. The sources are Crespo (1995) for 1990-96 and UNCTAD-TRAINS[23], the Secretary of Foreign Trade of the Argentine Ministry of Economy and the decrees that modify tariffs.

During the 90s Argentina underwent a process of trade liberalization, both on a MFN basis and on a regional basis, that significantly lowered protection to its manufacturing sector. The onset of the decade witnessed a sharp drop in both the average tariff and the dispersion of tariffs.[24] The formation of Mercosur (the customs union with Brazil, Paraguay and Uruguay) in 1995 led to the elimination of most barriers for trade in manufacture at the regional level. The evolution of the tariff structure is shown in Table 3. Figure 7 shows the evolution of the degree of openness (exports plus imports relative to GDP), which appears to have been highly sensitive to trade liberalization. A preliminary eyeball inspection of the evolution of job flows shows that sharp tariff reductions in II.91 (on a MFN basis) and in I.95 (within the Mercosur) preceded important surges in destruction.

2.2.5 Workers' appropriation of quasi-rents

Our empirical analysis will, among other things, try to capture the role played by the appropriation of quasi-rents by workers. The existence of quasi-rents arises from investment specificities due to technological features and to labor market distortions such as large severance payments. The appropriation of these quasi-rents by workers reflects their bargaining strength. As proposed by Caballero and Hammour (1996), the presence of both investment specificities and workers' strength will disrupt the timing and the efficiency of

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[22] Boletín Informativo de Techint 283, Evolución de la protección arancelaria nominal y efectiva 1990-2001

[23] Trade Analysis and Information System, Spring 2000, Version 7.0

[24] This liberalization was partially compensated by the implementation of "Statistics Fees," which were temporary import taxes disguised as fees used to finance the collection and processing of data by the Customs Office. These fees, which reached up to 10% rates, were eliminated around 1995 and occasionally reinstated at different stints.

creative destruction. To control for the role of these distortions in the adjustment process, we compute a measure of the fraction of the quasi-rents that are appropriated by workers. Given that this appropriation will be reflected in the difference between sectoral wages and the workers' opportunity cost, we follow Menezes-Filho and Saba Arbache (2001) and construct this measure by running Mincerian wage regressions on workers' attributes, sector-specific dummies and measures of labor productivity that proxy for quasi-rents. We then compute the share of inter-industry wage differentials that is due to sectoral quasi-rents. The data sources are the Permanent Household Survey for wages and workers' attributes and the Monthly Industrial Survey for productivity.

3 Analytical framework

One of the key questions this paper seeks to shed light on is how manufacturing job flows and productivity growth in Argentina were affected during the 1990s by: a) shocks to the user cost of capital, b) labor reforms that change non-wage labor costs, c) trade reforms that alter tariff dispersion, d) institutional features that affect the working of the credit, labor and goods markets. Additionally, it intends to clarify the connection between reallocation and productivity growth, and how much of the effect of policy shocks on productivity growth arises from their effect on reallocation.

Regarding the direct effects of innovations to the user cost of capital, non-wage labor costs (NWLC) and sectoral tariffs, we start by asking whether these shocks are aggregate or allocative in nature. Policy shocks affect gross job flows through aggregate channels when they make creation and destruction move in opposite directions, i.e., when they either promote a reallocation of jobs to and away from the manufacturing sector as a whole or a reallocation between different manufacturing industries. Instead, allocative shocks are those that make creation and destruction move together, inducing or depressing job reallocation within each manufacturing industry. This is the approach followed, for instance, by Davis and Haltiwanger (2001).

We go on to ask whether these shocks prompt bigger within-sector job reallocation or not. The interest on whether this is the case arises from the theoretical propositions that within-sector job reallocation should permit the reshuffling of jobs from less efficient

production units to leading-edge establishments, thus contributing to bigger productivity.[25] On the other hand, shocks that depress reallocation may foster technological sclerosis.

The aggregate channels through which a shock may affect job flows include:

- Effects on potential output (effects on investment) that either reduce or rise permanently the demand for labor.

- Changes in relative prices and/or costs of production of the manufacturing sector vis-à-vis the rest of the economy that promote reallocations to or away from this sector as a whole.

- Changes in relative prices or costs of production among manufacturing industries that induce reallocations among these sectors.

- Increases in the marginal costs of job creation.

A shock has allocative effects when it introduces a mismatch between the observed and the desired distributions of labor within a manufacturing sector. Negative profitability shocks that lead to the scrapping of the most backward production units potentially have this effect. By generating bigger unemployment these shocks reduce the costs of search and facilitate job creation by more advanced establishments.

Shocks that are allocative in nature may appear in the data as having allocative effects because of institutional factors or a policy environment that interfere with the restructuring induced by these shocks (see Caballero and Hammour (1996), for instance). The timing and the efficiency of this process is disrupted whenever workers have an "excessive" bargaining power and/or there are significant sunk costs in job creation arising from either technological features or labor regulations (such as large severance payments) that introduce a high level of specificity for the capital invested in a production unit. In such an environment, the appropriation of quasi-rents by workers will prevent the required adjustment in wages for existing jobs, and the fall in the shadow wage in response to a negative profitability shock must be accomplished via a decoupling of creation and destruction. Other policy/institutional features, like high trade protection, that muffle fluctuations in profit margins in response to shocks will tend to depress both creation and destruction.

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[25] See for instance Caballero and Hammour (1996), Gourinchas (1999) and Mortensen and Pissarides (1994), among others.

We can now set our priors regarding the effects of the proposed shocks. An upward shock to the cost of capital could affect job flows through both aggregate and allocative channels. First, by reducing the demand for labor across the board via reduced investment and potential output. Second, by inducing a substitution of capital for labor. Third, by acting as a negative profitability shock that could potentially induce bigger job reallocation.[26] Fourth, by raising the investment costs that are necessary to create a job.

Innovations to NWLC would also act through both aggregate and allocative channels. A rise in these costs will act as negative profitability shocks that prompt bigger destruction. The possible positive effects of lower search costs on creation by leading-edge firms are likely to be outweighed by the incentive to substitute away from labor. The shock would also reduce the operating costs in manufacturing *relative* to the rest of economy, which can have an aggregate effect on manufacturing employment.[27][28]

The final variable under consideration are import tariffs, which can affect job flows through both types of channels. First, increases in a sector's relative tariff should lead to an intersectoral reallocation of labor from other sectors. Second, tariffs would act as permanent production incentives that lower destruction and reallocation rates.

Policy and cyclical shocks will have both direct effects on sectoral labor productivity and indirect effects via their impact on the reallocation of labor from the most obsolete production units to the most advanced ones.[29]

In order to ascertain the nature of the effects of policy reforms and cyclical shocks on gross job flows and on productivity, we will conduct a Vector Autoregression Analysis that is discussed in detail in next section.

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[26] This last channel arises from the negative impact of the shock on aggregate demand and from the capital-intensive nature of manufacturing production.

[27] This is due to the fact that, according to the 1997 Input-Output tables, manufacturing is 2.5 times less labor intensive than the rest of the economy.

[28] Innovations to these costs arising from bigger mandatory severance payments would reduce both creation and destruction, but we do not expect this effect to be present, as changes in firing costs were infrequent and small.

[29] The direct effects will come for instance from the the imports of capital goods and intermediate inputs with embodied technological knowledge that are facilitated by trade liberalization.

4 Econometric specification and identification

The analysis of the sign, size and timing of the effects of the different shocks on creation, destruction and productivity will be undertaken by means of a Constrained Panel Data Near VAR analysis as in Davis and Haltiwanger (2001) and Gourinchas (2000). To this end we consider an ten-variable linear stochastic system for each 2-digit industry under analysis.[30] The VAR for sector *j* contains an aggregate bloc with the terms of trade, total manufacturing job creation and destruction, aggregate labor productivity, the user cost of capital and non-wage labor costs, and a sectoral bloc with sectoral tariffs, sectoral job creation and destruction, and sectoral productivity.

Let $Y_t = [p_t, X_t, Z_t, a_t, r_t, q_t, t_{jt}, p_{jt}, n_{jt}, q_{jt},]'$, be a vector that contains the time *t* values of the terms of trade, aggregate job creation, aggregate job destruction, aggregate labor productivity, the aggregate user cost of capital, aggregate non-wage labor costs, sectoral tariffs, sectoral creation and sectoral destruction and sectoral productivity. It is assumed that Y_t has a linear moving average representation in terms of innovations to structural disturbances:

$$Y_t = B(L)\,\varepsilon_t \qquad B(0) = B_0 \tag{1}$$

The elements of e_t correspond to time *t*-values of innovations to the terms-of-trade disturbances, two unspecified aggregate disturbances, the aggregate productivity disturbances, the user cost of capital disturbances, non-wage labor costs disturbances, sectoral tariff disturbances, two sector-specific disturbances and sectoral productivity disturbances, respectively.

We cannot estimate (2) directly. Instead we will estimate a reduced form of this equation. By making a series of identifying assumptions we will be able to recover B_0 from the estimated residuals by Cholesky factorization. Having done this we can go on to estimate the contribution of each innovation to the structural disturbances to the variance of the forecast error. We can also recover *B(L)* and compute the impulse-response functions to the different innovations to structural disturbances.

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[30] The VARs were not estimated for two of the 22 2-digit level industries because employment data for these industries from the Monthly Industrial Survey became available only after 1997.

The VAR we estimate is:[31]

$$Y_t = D(L)\, e_t \qquad (2)$$

Recovery of the coefficients of the structural VAR is made possible by the fact that $e_t = B_0 e_t$, and that $B(L) = D(L)B_0$. Given that we do not know B_0, some identifying assumptions are made. Following Davis and Haltiwanger (2001), we partially identify $B(L)$ and e_t by introducing restrictions on B_0, $D(L)$ and the contemporaneous variance-covariance matrix of e_t. We first assume that:

$$d_{ip}(l) = d_{in}(l) = d_{iq}(l) = d_{it}(l) = 0 \text{ for all } l, \text{ and } i = p, X, Z, a, r, q \qquad (3)$$

Sector specific variables are not allowed to affect variables in the system that are common to all sectors. The response functions $B(L)$ are allowed to change across sectors without restrictions.

The restrictions on B_0 are given by:

$$e_p = e_p$$

$$e_X = b_{Xp}e_p + e_X + b_{XZ}e_Z$$

$$e_Z = b_{Zp}e_p + b_{ZX}e_X + e_Z$$

$$e_a = b_{ap}e_p + b_{aX}e_X + b_{aZ}e_Z + e_a$$

$$e_r = b_{rp}e_p + b_{rX}e_X + b_{rZ}e_Z + b_{ra}e_a + e_r$$

$$e_q = b_{qp}e_p + b_{qX}e_X + b_{qZ}e_Z + b_{qa}e_a + b_{qr}e_r + e_q$$

$$e_t = b_{tp}e_p + b_{tX}e_X + b_{tZ}e_Z + b_{ta}e_a + b_{tr}e_r + b_{tq}e_q + e_t$$

$$e_p = b_{pp}e_p + b_{pX}e_X + b_{pZ}e_Z + b_{pa}e_a + b_{pr}e_r + b_{pq}e_q + b_{pt}e_t + e_p + b_{pn}e_n$$

$$e_n = b_{np}e_p + b_{nX}e_X + b_{nZ}e_Z + b_{na}e_a + b_{nr}e_r + b_{nq}e_q + b_{ht}e_t + b_{np}e_p + e_n$$

$$e_q = b_{qp}e_p + b_{qX}e_X + b_{qZ}e_Z + b_{qa}e_a + b_{qr}e_r + b_{qq}e_q + b_{qt}e_t + b_{qp}e_p + bq_ne_n + e_q$$

We additionally assume that the covariance matrix of structural innovations is bloc diagonal. The assumptions made impose a bloc recursive structure with 8 blocs:

[31] In practice, given the relatively small sample the reduced-form VARs we estimate include 2 lags.

- one terms of trade variable

- total manufacturing job creation and destruction

- aggregate labor productivity

- the aggregate user cost of capital

- the aggregate non-wage labor cost

- sectoral tariff

- sectoral job creation and destruction

- sectoral labor productivity

Under these assumptions, the terms of trade are taken to be fully exogenous, allowing us to can estimate the contribution of terms-of-trade shocks to the forecast-error variances of all the variables in the system. The available evidence shows that Argentina's exports are mostly commodities, oil and gas products and processed food with low valued added (over 50% of all exports). In such case, and with Argentina being a small economy, its terms of trade would be largely determined by the relative prices in world markets.[32]

The unspecified common disturbances e_X and e_Z represent the components of the reduced-form innovations to aggregate manufacturing job creation and destruction that are orthogonal to the terms of trade innovations. We do not seek to attempt identification within this bloc. We include these disturbances in order to interpret our sectoral near VARs as a constrained panel, as in Davis and Haltiwanger (2001) and Gourinchas (1998). The bloc for aggregate labor productivity is placed next to capture the possibility that it varies cyclically due to adjustment costs and/or variations in factor utilization rates. This selection of causal ordering also reflects our priors regarding the effects of reallocation on productivity. The e_a disturbance represents the innovation to aggregate productivity that is orthogonal to the terms-

[32] It is usually argued that when the nominal exchange rate is fixed and PPP does not hold, the terms of trade depend both on domestic productivity relative to foreign productivity and on the rigidities in domestic factor markets, or the evolution of domestic wages in the case of Argentina in the 1990s, which would make the terms of trade partly endogenous. For this argument, which is based on a Ricardian model, to hold, it would require that Argentina's exports differentiated goods. However, the available evidence shows that Argentina's exports are mostly commodities, oil and gas products and processed food with low valued added (over 50% of all exports). What is more, the correlation between the terms of trade and domestic wages in tradable activities during the 1990s was -25.8%, the sign being the opposite to what this argument would predict.

of-trade innovations and to the aggregate job creation and destruction innovations.[33] The inclusion of this disturbance also helps interpret the sectoral near VARs as a constrained panel.

The bloc for the user cost of capital identifies e_r as the component of the reduced-form innovation to this variable that is orthogonal to innovations in the preceding aggregate variables. It makes sense to place this variable after the preceding aggregate variables as its behavior over time depends largely on the evolution of the nominal interest rate and inflation, which in turn depended on the response of international capital flows and the country-risk premium to unanticipated aggregate shocks (recession, productivity slowdown, etc.) that affected the expected rate of return on capital.[34] These determinants of the user cost of capital would be captured by the first four terms of the bloc. The autonomous component of the shocks to the user cost of capital reflects either foreign developments or changes in domestic financial policies that are not affected by other aggregate shocks within the quarter.[35]

The decision to include the aggregate non-wage labor costs next is based on the fact that this variable is partly endogenous and partly determined by exogenous policy shocks. Recall that our measure of non-wage labor costs is made of the sum of labor taxes plus expected severance payments. The latter depend on the probability of firing a worker and on the average duration of employment. These last two variables clearly depend contemporaneously on the aggregate shocks. On the other hand, we consider labor taxes and the severance payment per worker as not being contemporaneously affected by these aggregate shocks. While these taxes and regulations are largely endogenous, their determination responds to shocks with a lag. In this vein, e_q would represent the innovation to autonomous decisions regarding labor taxes and regulations.[36]

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[33] This disturbance may reflect either the exogenous arrival of new technologies or the adoption of labor-saving innovations. The adoption of labor-saving innovations could reflect an endogenous response to innovations in non-wage labor costs or in the cost of capital, for instance. Here we are assuming that the eventual endogenous adoption of such innovations occurs only with a lag and are hence unaffected by other contemporaneous shocks.

[34] The prevalence of the Currency Board during most of the 1990s (it was introduced in early 1991 and lasted until the end of 2001) meant that Argentina lacked any active monetary policy. In this setup, the endogeneity of interest rates arises not from feedback rules of policymakers, but rather from the sensitivity of foreign capital flows and the risk premium to the aforementioned domestic developments.

[35] As pointed out by Calvo, Leiderman and Reinhardt (1992), capital inflows, interest rates and the risk-premium also depended on foreign, "exogenous," developments such as the interest rates in the industrialized countries and foreign payments crises in other emerging markets. Despite the lack of an active monetary policy un the Currency Board, the user cost of capital is also exogenously shocked by autonomous innovations to regulations in the banking system.

[36] It could be argued that disturbances to non-wage labor costs that hamper the competitiveness of Argentine businesses could have a negative effect on capital flows and thus raise the user cost of capital, but if capital markets anticipate these innovations they would incorporate their effects on interest rates in advance, which would justify the causal ordering we are choosing here. The unexpected exogenous innovations to

We place next the sectoral tariff bloc. We prefer to focus on sectoral tariffs rather than on average manufacturing tariffs because trade reforms encompass not only the average protection levels but also the tariff structure, and both types of changes matter for sectoral creation and destruction. Changes in the own sectoral tariff are particulary relevant, as mentioned in the analytical framework. This bloc is put next to the aggregate blocs to reflect the fact that the trade-weighted tariffs, that depend on the share of Argentina's intra-Mercosur imports, are affected by the aggregate shocks that affect Argentina's sources of imports, like changes in bilateral relative costs of production caused by shocks to the user cost of capital and non-wage labor costs. These determinants of sectoral tariffs would be captured by the first five terms of the bloc.[37] Under this interpretation, e_t would represent the component of the reduced-form innovations to sectoral tariffs that is orthogonal to the aggregate shocks.

The bloc of disturbances to sectoral creation and destruction is placed next. We allow all common disturbances and shocks to sectoral tariffs to contemporaneously affect sectoral job creation and destruction. We also include two unspecified sectoral shocks, e_p and e_q, that are orthogonal to all other shocks and that we do not seek to identify separately.

The final bloc includes the disturbances to sectoral labor productivity. We interpret this variable as being contemporaneously affected by the aggregate shocks, the sectoral tariff, by the other unspecified sectoral shocks and by an autonomous technological shock. We thus interpret e_q as representing the component of the reduced-form innovations to sectoral productivity that is orthogonal to innovations in all the preceding variables.[38]

Our restrictions on B_0 and the assumed causal ordering seek to allow us to: a) identify, and control for, the main determinants of manufacturing job creation and destruction and of labor productivity, b) identify the reallocative and productivity effects of autonomous shocks

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these non-wage labor costs could still have a contemporaneous effect on the cost of capital, but it is likely to be very small. We assume this effect to be negligible, which allow us to identify separately the exogenous innovations to both variables.

[37] We acknowledge that the determination of tariff rates by policymakers is subject to lobbying activities from sectoral vested interests, to second-best considerations and to non-economic objectives that are likely to reflect shocks to sectoral and aggregate variables. We assume however that tariffs do not respond inmediately to these shocks, as tariff changes have to be subject to political agreement both within the country and within the Mercosur, which is why we place tariffs ahead of the other sectoral variables.

[38] With this causal ordering we are allowing for the possibility that sectoral labor productivity vary cyclically due to adjustment costs and/or variations in factor utilization rates. It also makes sense to place sectoral job creation and destruction ahead of causality because we are positing a positive contribution of reallocation to productivity growth.

to the user cost of capital, shocks to non-wage labor costs and sectoral tariff innovations, and establishing whether these cyclical and policy shocks have allocative or aggregate effects.

As in Davis and Haltiwanger (2001), our approach offers several appealing features. First, it allows for multiple observed and unobserved shocks. Second, our approach identifies common terms of trade, labor productivity, cost of capital and non-wage labor costs shocks that hit all sectors and the sector-specific tariff shocks, while allowing the impulse-response functions to vary freely across sectors. Third, the assumed specifications do not prejudge whether common policy and sector-specific shocks affect manufacturing and sectoral gross job flows through aggregate or allocative channels. Finally, the inclusion of lagged values of manufacturing creation, destruction and productivity in each sectoral equation transforms the sectoral near-VAR systems into a constrained panel VAR, where we proceed as if we included sectoral creation, destruction and productivity as regressors and constrained their coefficients to be proportional to sectoral size.[39]

One key innovation in our approach is the inclusion of manufacturing and sectoral labor productivity variables in our sectoral near-VAR systems. We are concerned with the contributions of reallocation and policy shocks to productivity, both in the short run and in the long run.[40] These effects can be appraised by comparing the responses of productivity to the different shocks when the responses of labor flows are shut-off, as in Bernanke, Gertler and Watson (1995), to the responses obtained in the baseline case.

5 Aggregate and sectoral labor and productivity dynamics

5.1 Variance decomposition analysis

In this subsection we estimate the contribution of each bloc of shocks to the variances of the forecast errors for the aggregate and sectoral gross job flows and productivities. We start by characterizing the contribution of each bloc of aggregate shocks to the variances of the

[39] We do not constrain the weighted sum of of sectoral creation, destruction and productivity responses to equal the total respones. In practice, violations of this adding up constraint are usually small.

[40] The contributions in the short run will come from short run employment movements combined with fixed installed capacity due to adjustment costs and/or variations in factor utilization rates. Policy reforms and reallocation should have long run effects, as suggested by previous findings in other countries that show that it usually takes several years for intra-sectoral restructuring to be reflected in bigger productivity growth.

forecast errors of aggregate gross job flows and productivities.[41] Let us focus on the 8-step ahead forecast errors. The results presented in Table 4 suggest that shocks to the user cost of capital are the leading determinants of variations in aggregate creation, being followed at some distance by the unspecified aggregate shocks and by the shocks to aggregate productivity. On the other hand, the unspecified aggregate shocks are the key determinants of variations in aggregate destruction, being followed from afar by the shocks to the user cost of capital and by the aggregate productivity shocks. Finally, productivity shocks themselves are the key determinants of the variance in the forecast error for aggregate productivity, shocks to the user cost of capital occupy a distant second place, and the rest of the variables have a very modest explanatory role. Shocks to NWLC play practically no role in the variability of aggregate job creation and productivity, and a very small part in the variance of destruction.

Table 5 displays the employment weighted average contributions of aggregate and sectoral shocks to the forecast-error variance of gross job flows and productivity for sectors classified by 2-digit industry. We will concentrate on the analysis of the contributions of the policy and financial shocks. Focusing on the variance of creation, we observe that in the very short run (four steps ahead) shocks to NWLC, the cost of capital and tariffs all play significant roles, but when we look at eight steps ahead, the contributions of the first two are significantly reduced, while that of tariffs is enhanced. A similar pattern of contributions to the variance of destruction is observed, although in this case the relative importance of NWLC vanishes in the 2 years after the shock, and the cost of capital is always the leading contributor among these shocks. It is important to highlight that the contributions of the policy and financial shocks are always quite small relative to the unspecified sectoral shocks.

These results suggest that each block of policy and financial shocks plays a non-trivial role in accounting for the variability of gross job flows, especially in the short run. Compared to the variability of aggregate job flows, we observe that the unspecified shocks, especially the sectoral ones, now play a more significant role that reduces the influence of the cost of capital.

If we concentrate on the variance of sectoral productivity, we can see that the biggest contributors to its variability are the aggregate productivity shocks, but that the policy and financial shocks also play a non-negligible role, especially in the short run. It is worth

[41] We are able to do so because each near VAR contains an aggregate bloc that is common to all sectors.

highlighting that the unspecified sectoral shocks play relatively small, but significant, roles in explaining the variance of sectoral productivity, suggesting that reallocation does contribute to productivity changes.

5.2 Impulse-Response analysis

5.2.1 The dynamic response to user cost of capital shocks

Figure 8 shows that aggregate destruction rises and aggregate destruction falls until the fifth quarter following a unit standard deviation shock to the cost of capital. The peak response of employment occurs two quarters after the shock.[42] The cumulative response of employment growth is -0.89% after 8 quarters and –0.45% after 16 quarters. Job reallocation falls throughout.[43] The figure also shows that creation rates and destruction rates move in opposite directions in the short run and that their responses converge to zero in the long run.[44]

The response pattern fits the profile of an aggregate disturbance in the short-run, with a negative response of employment. Destruction goes up, while creation and reallocation decline.[45] These responses are consistent with either a prevalence of aggregate effects and/or the presence of institutional features that de-couple creation from the destruction wave that is induced by the rise in operating costs.

Figure 8 shows that the response of aggregate labor productivity to this shock is always negative, but that much more so in the short run.[46] What is more, it is significantly different from zero only up to the second quarter after the shock.

The sectoral creation and destruction responses to the cost of capital for all 20 detailed sectors were also examined. The impulse response functions for selected sectors are presented in Figure 9, and the results for all sectors are summarized in Table 6.

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[42] This response is generated by a 0.19% rise in destruction and a 0.15% decline in creation.

[43] The cumulative responses are -0.45% until the eighth quarter and -0.61% until the 16th quarter.

[44] The cumulative responses of aggregate creation and destruction respectively are –0.67 and 0.22% after 8 quarters and –0.53% for creation and –0.08% after 16 quarters.

[45] The long-run response pattern fits more the profile of an allocative disturbance that results from depressed destruction and creation, although the absolute value of the cumulative decline in creation is almost seven times the decline in destruction, which amounts to only –0.08%.

[46] The cumulative productivity decline is –5.4% after 8 quarters and –6.9% in the 4 years after the shock.

The results show that net employment growth goes down in 80% of the industries in the short run. The shock has opposite effects on creation and on destruction for 60% of the sectors in the short run, and for 50% in the long run. This point suggests that shocks to the user cost of capital affect gross job flows at the sectoral level through a mixture of aggregate and allocative channels, and that there is a lot of heterogeneity in the sectoral responses.

Creation falls in 85% of the industries 2 and 4 years after the shock, while destruction rises in 65% of the cases in the short-run (50% in the long-run). A final point to note is that reallocation declines in 65% of the industries in the short-run and remains basically unchanged in the long-run.[47] The typical effect of a shock to the user-cost-of-capital is thus to depress job creation and to rise destruction, especially in the 2 years after the shock. Even though this shock has allocative effects on several industries, it usually tends to reduce reallocation.

This response pattern suggests that shocks to the cost of capital have sizable negative effects on the costs of creating jobs and possibly reduce other variables, like potential output, that are positively associated to job creation. The relatively more mixed effect on destruction suggests that sectoral characteristics may affect the response of destruction to this shock.

To illustrate the heterogeneity of responses, Figure 9 presents the impulse-response functions to cost-of-capital shocks for six selected industries that differ in their sectoral characteristics.[48]

Regarding the response of labor productivity to the user-cost-of-capital shock, we observe that it declines in 85% of all cases in the short run and in 75% in the long-run. One possible explanation would be that depressed reallocation lowers productivity.[49] In this vein it is worth highlighting that productivity declines 4 years after the shock in eleven out of fifteen

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[47] It is also worth noting that the magnitude of the 2-year sectoral destruction response is larger than the magnitude of creation for 60% of the industries (for 45% after 4 years).

[48] Four industries display above aggregate negative employment responses two quarters after the shock: Wood and Products of Wood, except Furniture (capital-intensive, little access to credit, weak workers, closed to trade), Non-metal Mineral Products (marginally labor-intensive, average access to credit, weak workers, closed to trade), Electrical Machinery and Equipment (labor intensive, good access to credit, strong workers, very open to trade), Furniture and Matresses (capital-intensive, good access to credit, weak workers, closed to trade). All these industries, except for Electrical Machinery and Equipment, display a peak rise in destruction that largely exceeds in absolute values the trough in creation. Two industries show impulse-response functions below the aggregate ones: Machinery and Equipment (marginally labor intensive, little access to credit, weak workers, open to trade) and Chemicals and Chemical Products (marginally labor intensive, average access to credit, strong workers, open to trade).

[49] Other possible explanations for this pattern would be that upward shocks to the cost of capital slow down the incorporation of productive knowledge embedded in new capital goods and/or that they lead to the use of more labor intensive production techniques.

industries where reallocation goes down. More light on whether this correlation actually reflects the proposed causality will be shed on Section 8.

Figure 9 displays the impulse-response functions of productivity for the six selected industries. We observe that labor productivity goes down all in these industries in the short run, usually until the tenth quarter after the shock, and in most in the long-run, so that sectoral characteristics do not seem to affect the sign of the responses.

5.2.2 The dynamic response to non-wage labor cost shocks

A positive shock to non-wage labor costs is seen to lead to a large rise in destruction and to no changes in creation at its aftermath. The increase in destruction rates lasts until the sixth quarter, converging to zero thereafter (see Figure 8).[50] The peak response of net employment growth occurs in the the first quarter after the shock, when it declines –0.17%, and it is fully generated by the rise in destruction.[51] The cumulative response of employment growth is -0.65% two years after the shock, and –0.52% two years after that. Job reallocation rates rise steadily until the sixth quarter after the shock and begin to decline very slowly since then.[52] The pattern of response conforms to an aggregate disturbance that results from increased destruction and unchanged creation.[53]

These responses suggest that this shock acts mostly as a negative profitability shock. The lack of reaction of creation could arise from the offsetting effects of the shock on search costs and from the incentives to substitute away from labor entailed by the bigger NWLC.[54]

The response of aggregate labor productivity to this shock is negative, albeit not significantly different from zero, at all times. Hence the bigger reallocation induced by a shock to NWLC does not seem to lead to higher productivity. It would seem that the jobs that are destroyed first are not the less productive ones, which is counterintuitive.

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[50] The cumulative responses of creation and destruction five quarters after the shock respectively amount to 0.06% and 0.57%. Two years after the shock those responses respectively amount to –0.03% and 0.62%. The same responses 4 years after the shock are –0.03% and 0.49%.

[51] The magnitude of this peak response is about half as large as the one generated by a shock to the user cost of capital.

[52] As a result, the cumulative responses of reallocation are positive and large both in the short-run (0.59%) and in the long run (0.46%).

[53] The absolute value of the long-run cumulative rise in destruction is about 15 times bigger than the decline in creation.

[54] The reduction in the manufacturing costs vis-à-vis the rest of the economy would also help to prevent a decline in creation.

The sectoral creation and destruction responses to the non-wage labor cost shocks were also examined. The impulse response functions for selected sectors are presented in Figure 9, and the results for all sectors are summarized in Table 6. The results show that net employment growth goes down for 70% of the industries in the short run but for none in the long run. The shock moves creation and destruction in the same direction in 60% (50%) of the sectors in the short-run (long-run). This result would suggest that shocks to NWLC operate on sectoral gross job flows both through aggregate and allocative channels.

The absolute values of the responses of destruction at the industry level exceed those of creation in 70% of the industries in the short-run (75% in the long-run). Destruction rises in 80% of the cases in the short-run (65% in the long-run). Additionally, gross job reallocation goes up in 85% of the industries in the short-run (75% in the long-run). The typical cumulative effect of a NWLC shock is thus to raise job destruction and job reallocation. Figure 9 presents the impulse-response functions to non-wage labor cost shocks for the same six industries that we chose to illustrate the effects of shocks to the cost of capital. [55]

A positive shock to NWLC is estimated to increase labor productivity in only 35% of the industries in the long run (40% in the short run), replicating at the sectoral level the aggregate finding that this shock does not appear to lead to the destruction of the least productive jobs. In this vein, it is worth mentioning that productivity grew in the long run only in 6 out of 15 industries where reallocation went up. Figure 9 displays the impulse-response functions of productivity for the six selected industries.[56]

5.2.3 The dynamic response to trade reforms

Figures 9 and 10 display the impulse-response functions of sectoral gross and net job flows and productivity dynamics for selected industries to changes in sectoral tariffs (relative to the average tariff). The results for all sectors are summarized in Table 6.

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[55] If we focus on the cummulative impulse responses of employment 2 years after the shock, we observe that only two industries, Wood and Products of Wood and Furniture and Matresses, had responses that were smaller in absolute value than the aggregate response. A distinguishing feature of these two industries, which are capital-intensive, is that both had positive cumulative responses of job creation, both in the short and in the long runs, while the rest had negative responses that usually exceeded the magnitude of the aggregate responses.

[56] Productivity declined in all these sectors, except in the Wood and Products of Wood industry, which experienced rather large increases in creation, destruction and reallocation. It also rose in the short run in the Electrical Machinery and Equipment industry, which displayed a relatively large increase in destruction and basically no change in creation.

The estimations are quite imprecise. Focusing on the signs of the impulse-responses, the results show that in the long run net employment growth goes up in 45% of the industries, and declines in 0% of the cases.[57]

The shock has opposite effects on creation and on destruction in 55% of the sectors in the short run, and in 60% in the long run, suggesting that tariff shocks affect sectoral gross job both through aggregate and allocative channels, but that the former are more prevalent. Creation rises in only 35% of the industries 4 years after the shock (30% in the short-run), while destruction falls in 60% of the cases in the long-run (50% in the long-run). Additionally, in the long run reallocation decreases in 65% of the industries (45% in the short-run)

Albeit imprecise, the results suggest that the leading effects of sectoral tariff hikes are to depress destruction and reallocation. Tariffs thus seem to act as permanent production incentives that protect existing jobs and sclerosize the labor market. [58]

Figure 10 presents the impulse-response functions to sectoral tariff shocks for the same six industries that were chosen to illustrate the effects of shocks to aggregate variables. Only two of these industries, Furniture and Matresses and Machinery and Equipment, display decreased destruction at all times in response to a sectoral tariff hike.[59] Figure 10 shows the impulse responses of three other industries that fit more with the more prevalent response patterns. The disparity of responses to sectoral tariff shocks suggests that sectoral characteristics may play an important role in shaping the response to these shocks.

A positive tariff shocks lowers productivity in 70% of the industries at all times. The dulling effect of tariffs on reallocation, and especially on destruction, appears as a big suspect for this effect of tariffs on productivity, as long run productivity declined in nine out of the thirteen industries where reallocation went down. Tariffs appear to be protecting the most obsolete jobs. Figures 9 and 10 display the impulse-response functions of productivity for the nine selected industries. The most salient point is that productivity went down in most of the industries where reallocation declined.

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[57] The corresponding shares for the long run responses are 40% and 55%, respectively.

[58] We do not find evidence supporting a relative price effect that raises creation by shifting resources away from other manufacturing industries.

[59] The other four industries feature in most cases reduced creation, increased destruction, lower net employment growth, and augmented reallocation. This response pattern is the least common in this sample.

6 The importance of sectoral characteristics

The preceding section has illustrated how some particular industries display unusually large or small responses of job flows and productivity to the different shocks. Additionally, a given shock seemed to affect job flows via aggregate channels in many sectors and via allocative channels in others. The analysis made highlighted the difficulty to pin down the differences in responses to any characteristic in particular.

Following Davis and Haltiwanger (2001), we will seek to disentangle the relative contribution of each characteristic to the industry-level responses of job flows and productivity to each shock. To this end we run set of linear regressions where we regress the cumulative responses of net employment, gross job reallocation and productivity on industry-level measures of labor intensity, access to credit, workers' strength, and a measure of exposure to trade and of trade orientation. The cumulative responses are obtained from the estimation of the near-VAR systems for 20 2-digit manufacturing industries performed in the previous section. The relatively small number of degrees of freedom may make the estimation a bit imprecise, but this analysis should nevertheless provide some useful information.

We do not have data at the firm or plant level for any of these characteristics that would allow us to compute the industry averages by aggregating the micro data. Instead, we make use of data are already available at the industry level.[60]

Table 7 summarizes the estimated impact and the statistical significance (*p*-values) of the characteristics in explaining industry differences in the step-7 cumulative response of the net employment growth rate, the step-15 cumulative response of the job reallocation and the step-15 cumulative response of productivity. Let us now consider how sectoral characteristics affect the effects of the different shocks:

[60] The estimates of sectoral labor intensity are obtained from the 1997 Input-Output Tables that provide information on the contribution of labor to industry-level value added. The access to credit variable is defined as the average for 1993-1999 of the ratio of the stock of credit to each industry to the gross value of production in each industry. The sources are the Argentine Central Bank for the stock of credit and the Ministry of Economy for the gross value of production. The definition, construction and sources for the measures of workers 'strength were explained in Section 2. Here we simply recall that we define it as the share of inter-industry wage differentials that is due to sectoral quasi-rents. We look at three measures of exposure to trade: sectoral degree of openness (industrial exports plus imports relative to industrial GDP), share of exports on sectoral GDP, and sectoral import penetration (imports relative to sectoral output plus imports). We also look at the sectoral trade balance relative to sectoral value added. The source for the trade data is INDEC, while for the sectoral value added and output is the Ministry of Economy. The measures correspond to averages for the 1993-2000 period.

ACCESS TO CREDIT: Industries with bigger access to credit, or that rely more on external financing, appear as more vulnerable to shocks to the cost of capital, reducing more their employment growth rates, albeit this effect is not significant at the usual confidence levels. On the other hand, these industries seem to be abler to finance the investments required to create new jobs in response to shocks to tariffs and to NWLC, thereby experiencing bigger rises (or smaller declines) in net employment growth.

WORKERS' STRENGTH: The presence of strong workers tends to reduce net employment growth and reallocation in response to shocks to the cost of capital and to the terms of trade. On the other hand, it appears to raise destruction and reallocation more in response to a NWLC shock. When positive sectoral tariff shocks attain, the industries where workers have larger bargaining power tend to raise employment more and to reduce reallocation less, pressumably via bigger increases in creation.

OPENNESS TO TRADE: Industries that are more open to international trade display bigger flexibility and decline less, or raise more, their net employment growth and reallocation and productivity in response to shocks to the cost of capital and to the terms of trade.[61] On the other hand, these industries seem to be more sensitive to a rise in NWLC, decreasing net employment growth and productivity more, and experiencing lower rises in reallocation.[62] The more open sectors also appear to raise net employment growth less and to reduce reallocation more in response to a tariff hike, which suggests that they raise creation less.[63] These more open industries additionally have their productivities decline less in response to the tariff shocks.[64]

NET TRADE: More net-exporting, or less net-importing, industries seem to be more sensitive to the negative effect on competitiveness of rises in the user cost of capital, experiencing bigger declines in net employment growth, reallocation and productivity in response to this shock. Puzzlingly, it appears that these industries have their net employment

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[61] The smaller vulnerability of more open industries to shocks to the user cost of capital suggests that these industries benefit from access at cheaper, and more stable, cost from foreign sources that is collateralized with their export revenues and/or that they have a bigger ability to hedge their sales and revenues against domestic recessions by reorienting their sales towards foreign markets.

[62] It would seem that the more open industries are more hurt by the loss of international competitiveness provoked by a rise in NWLC.

[63] The reason why net employment growth rises less in more open industries could be due to the fact that positive tariff shocks resulting from a rise in Mercosur's common external tariff could lead to increased competition from Brazilian firms.

[64] This finding is consistent with the result that these industries also appear to raise creation less in response to this positive profitability shock.

growth rates raise less and their reallocations and productivities fall more in response to a positive shock to the terms of trade.[65] More net-exporting, or less net importing, industries also seem to be less affected by a rise in non-wage labor costs, reducing less their employment growths and raising their reallocations more. Finally, these sectors appear to benefit more from sectoral tariff hikes, raising employment more and reducing reallocation less.[66]

7 Reallocation and productivity

In order to shed some light on whether reallocation contributes positively to productivity, we now estimate the impact of the policy and cyclical shocks on productivity when the responses of job flows are shut-off.[67] The resulting impulse-response functions of productivity are then compared to the ones obtained for the unrestricted system. The problem with our approach is that we are shutting-off not only the responses of reallocation to the shocks, but also the responses of all job flows. Hence this procedure may capture not only the effect of reallocation on labor productivity but also the impact of changes in production techniques.[68]

Having made this caveat, we proceed to present the results of our analysis. Figure 11 displays the impulse-response functions of aggregate productivity when the responses of aggregate gross job flows are shut-off and when they are not (the baseline case). The results show that the productivity declines in response to increases the user cost of capital, NWLC and the terms of trade are bigger when the responses of job flows are shut-off. This would suggest, especially in the cases of the cost of capital and NWLC, that bigger destruction may be actually contributing to bigger productivity, partially offsetting the negative effects of the shocks on productivity that operate through channels other than reallocation. It should be noted that what we are measuring here is the contribution to the response of aggregate labor productivity of both intra-industry and inter-interindustry reallocation together.

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[65] Given that the behavior of the terms of trade of the terms of trade is dominated by the fluctuations in agricultural commodity prices and in oil prices, this result would seem to suggest that net exporters (or less net importers) are more negatively affected by the pull of resources towards agriculture and/or the rise in production costs associated to a higher price of oil.

[66] These industries would appear to benefit more from bigger tariff preferences when selling to the Brazilian market.

[67] A similar methodology was applied by Bernanke, Gertler and Watson (1995) and by Sims and Zha (2000) to analyze the contribution of the systematic component of monetary policy to the responses of prices and output to shocks to oil prices and commodity prices. To make this analysis they shut-off in the VAR system the response of the funds rate to the shock, and estimate the impulse-response functions of prices and outputs, which are then compared to the ones obtained in the unrestricted analysis.

[68] For instance, the decline in labor productivity in response to an upward shock to the cost of capital would be consistent both with the observed decline in reallocation and with an unobserved increase in the labor intensity of production.

The first column of Table 8 summarizes the distribution of the relative responses of productivity by industry when the responses of both aggregate and sectoral job flows are shut-off. There is substantial inter-industry heterogeneity in the estimated contribution of aggregate and sectoral gross job flows to sectoral productivity. However, productivity is seen to decline more for a majority of industries in response to shocks to the user cost of capital (55%), non-wage labor costs (65%), and the terms of trade (55%). This exercise captures more than the possible contribution of intra-sectoral reallocation to productivity, as both the aggregate and sectoral job flow responses are shut-off. We thus proceed to compare the impulse-responses of sectoral productivity when only the responses of sectoral flows are shut-off. The results, which are shown in the second column of Table 8, also point towards substantial inter-industry heterogeneity in the revealed contribution of reallocation to productivity. However, in this case job restructuring appears as less helpful for productivity in response to shocks to the terms of trade and to NWLC and more helpful when the economy is hit by a shock to the cost of capital.

8 Reforms and structural change

In the previous sections we estimated the impact of specific policy reforms, namely shocks to non-wage labor costs and to sectoral tariffs, on manufacturing gross job flows and labor productivity. We also estimated the role played by institutional features, such as sectoral reliance on banking credit, workers ’bargaining power and openness to trade, in facilitating or hindering intrasectoral restructuring in response to negative profitability shocks.

In this section we take up a broader question, which is whether reforms in general altered the nature of the responses of job flows to the different cyclical and policy shocks. To this end we start by characterizing the reforms that prevailed in different sub-periods of our sample and consider whether there were noticeable changes in gross job flows from sub-period to sub-period. We then test for structural breaks in the coefficients of the aggregate sub-system of our VAR and compare the impulse-response functions of gross job flows across sub-periods.

Our sample is too short, and reforms of different intensity overlapped at most times, to split it into several sub-periods. The visual inspection of the job dynamics and of the behavior of the cyclical and policy variables presented in Section 2 suggest 1995 as a break point in the series. This is not a casual choice of dates, as several major politico-economic events occurred

during that year: the Tequila crisis, the onset of Mercosur, the completion of most privatizations, significant cuts in labor taxes, and President Menem's reelection.

We now briefly characterize the major reforms (or lack of) and job dynamics that characterized the two sub-periods we consider. The most salient policy reforms and macroeconomic developments of 1991-1994 were the following: a) the introduction of the Currency Board which, together with accompanying consistent macroeconomic policies and the capital account liberalization, restored financial stability and a credible economic environment, b) a process of massive privatization and shutdown of state-owned enterprises that involved mostly public utilities, banks and transportation, but that included manufacturing activities like oil refining, steel, petrochemicals and shipyards,[69] c) the MFN trade liberalization of April 1991, when average tariffs were halved,[70] d) large labor taxes (contributions to Social Security represented 16% of formal wages), that were more than halved only in the second quarter of 1994. No changes in severance payments. Fixed-term contracts introduced in 1991 for workers under 24 only, e) sizable capital inflows and foreign direct investment,[71] f) relatively small reliance on banking credit to finance manufacturing production and investment.[72]

The 1995-01 was characterized instead by: a) the continuation of the Currency Board, b) no privatizations of manufacturing firms, c) the implementation of Mercosur, which rose the extra-zone tariffs but freed most intra-zone trade, d) lower labor taxes (about half the 1991-94 ones for most of the sub-period, except for 1995-96). Generalization of fixed term contracts between 1995 and 1998. Lower severance payments between 1998 and 2000, together with 6-month trial regime, e) larger, but more volatile, capital inflows, that peaked during 1997-1998,[73] f) a very significant restructuring of the banking system following the Tequila Crisis, which left the economy with a relatively small number of more efficient banks. More stringent liquidity and prudential requirements helped the return of deposits, which grew

[69] The oil industry was the one that had the largest employment share among these activities.

[70] This liberalization was partially offset by the imposition of "statistical fees" import surcharges.

[71] Net capital inflows of all types represented 6.35% of GDP in 1994.

[72] Reliance of manufacturing firms on banking credit represented 8.1% on average of the gross value of manufacturing production during 1993-1994.

[73] All capital inflows represented 7.11% of GDP on average during 1995-2001, 8.71% during 1996-1997 and 7.22% during 1998-2001.

steadily until the end of 2000,[74] g) bigger (than 1991-94) reliance of manufacturing firms on banking credit until 1997, when the Government's demand of credit started to crowd out the private sector.[75]

The key differences thus seem to be that the second sub-period had a relatively more flexible labor market, and that manufacturing firms were more dependent on banking credit, and hence more vulnerable to balance sheet effects. Regarding exposure to trade, Mercosur did seem to make a difference, as the degree of openness jumped from 15% of GDP in 1995 to 20% in 1998. A significant diversion of trade, specially for manufactures, towards Brazil took place, which rendered the Argentine manufacturing sector more vulnerable to macroeconomic shocks in Brazil.[76] The final remarkable difference is that during the first sub-period the firms undergoing a privatization process must have been more sensitive to adverse shocks.

Table 9 shows that after 1995 job reallocation was bigger, job creation was closer to job destruction and net employment growth was bigger, which would be consistent with the view that the post-1995 reforms made this period more flexible.

It is interesting to consider as well the differences over time in the gross job flows by different sectoral classifications. If we focus on the behavior of firms grouped by size, Table 10 shows that during the 1991-1994 sub-period the biggest establishments were more hard hit and displayed the largest job destruction rates, the smallest creation rates and the third largest reallocation rates. Privatizations are a big suspect for this pattern of restructuring by size. On the other hand, during the 1997-2001 sub-period the largest production units seemed to better fit to accommodate negative shocks, displaying destruction and reallocation rates that were significantly lower than those of other sizes, while the opposite happened to establishments of less than 50 employees. It seems that the restructuring that the 91-94 reforms provoked in large firms made them more resilient to adverse shocks, while the more flexible environment after 1995 induced bigger reallocation by the smaller establishments.

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[74] Deposits in Argentine financial institutions represented 15.9% of GDP on average during 1993-1994 and 25.2% during 1996-2001.

[75] The ratio of the use of banking credit by manufacturing firms to their gross value of production was, on average, 9.2% during 1995-1999, 8.7% during 1995, 9.8% during 1996-1997 and 8.9% during 1998-1999.

[76] While sales to Mercosur countries represented 18% on average of all Argentine exports during 1990-1992, the corresponding share in total exports jumped to 25% during 2000-2002.

The post-1995 reforms and policy and institutional environment also favored the performance of establishments operating in industries with high export shares, which declined their destruction and reallocation rates, and increased their creation and net employment growth rates (see table 11). The opposite happened to the establishments in low export share industries. Mercosur, increased access to banking and a relatively more flexible labor market appear to have favored those establishments with a bigger propensity to export.[77]

We now proceed to report the results for the test as to whether there was a structural break in our VAR coefficients in the first quarter of 1995. Given our small sample size, we are limited in two respects. First, we can only perform the test for the aggregate sub-system embedded in our sectoral VARs. Second, we do not have enough degrees of freedom to estimate the VAR for the 1991-1994 period, so that in order to test for a structural break we had to apply Fisher (1970)'s proposed methodology.[78]

The results presented in Table 12 indicate that the null hypothesis of subsample stability can be rejected for the aggregate job creation, user cost of capital and NWLC equations. If we were willing to consider up to an 18% level of confidence, then we could not reject the presence of a structural break in the coefficients of the destruction and productivity coefficients either.

We go on to compare the variance decompositions of the aggregate sub-system for 1995-2001 and for the whole period (see Tables 4 and 13). The results show that the relative contributions to the variance of aggregate creation remain basically unchanged, but that there are significant changes in the relative contributions to the variance of aggregate job destruction.

We finalize by comparing the impulse response functions of the aggregate sub-system for 1995-2001 and for 1991-2001, which are shown in Figure 12. Focusing on the effects of shocks to the user cost of capital, we observe that after 1995 these disturbances induce a bigger

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[77] Classifying establishments by import penetration does not offer a distinguishable pattern (see Table 13).

[78] Fisher (1970) proposes that when the time series are not long enough to estimate the regression for one of the sub-periods, a valid procedure for testing for a structural break is to estimate the restricted regression for the full time series and to compute the restricted sum of the residuals. Then the regression for the longer sub-period (1995-2001) should be estimated, and the unrestricted sum of residuals computed. This computation assumes that with a number of observations for the shorter sub-period ($n1$) smaller than the number of parameters to be estimated (K), we could obtain a perfect fit, thus contributing zero to the sum of squares. The F-statistic for each equation in the aggregate sub-system would be $F(n1, n2\text{-}K) = [(e^* \hat{e}^* - e \hat{e})/n1]/[e \hat{e}/(n2\text{-}K)]$, where e^* are the restricted residuals, e the unrestricted residuals and $n2$ is the number of observations for the longer sub-period.

decline in reallocation, creation and net employment growth, a bigger rise in destruction up to 1 year after the shock, and a bigger decline in destruction after the fourth quarter. Negative shocks to the terms of trade are seen to induce bigger rises in destruction and reallocation, and bigger declines in creation and in net employment growth. The response of reallocation to NWLC shocks does not change significantly, but these shocks now induce an increase in creation, a bigger rise in destruction and a rise in net growth.

These results suggest that shocks to the user cost of capital and to the terms of trade now become more aggregate in nature, although in the case of the terms of trade shocks reallocation rises more than in 1991-1994. On the other hand, NWLC shocks now clearly have an allocative nature.

The bigger rise in destruction in response to these three shocks seems to reflect the more flexible labor regulations. This bigger labor market flexibility also appears to have led to a bigger synchronization of creation and destruction in response to NWLC shocks. The bigger decline in reallocation and in net employment growth in response to shocks to the cost of capital would suggest that the larger reliance on banking credit (and the associated balance sheet effects of these shocks) led to both bigger negative profitability shocks and larger increases in the marginal cost of creation, outweighing the pro-reallocation effects of the more flexible labor regulations.[79][80]

9 Conclusions

This paper has unveiled a series of relations between cyclical and policy shocks, manufacturing job flows and productivity, policy environment, institutional features, and economic reforms during the 1990s in Argentina.

First, relying on the results of a Constrained Near Panel VAR applied to 20 industries, it has shown that shocks to the user cost of capital, to non-wage labor shocks and to sectoral import tariffs affect aggregate and sectoral job flows and productivities in non-negligible ways. In particular, while there is a high degree of heterogeneity in the responses across industries, shocks to the user cost of capital appear to act through aggregate channels, lowering job

[79] The loss of international competitiveness of industries that faced bigger exports from Brazil is likely to have played a role as well.

[80] It is also possible that when the cost of capital went up banks preferred to lend more to the government, which was more willing to pay higher risk premia and was also perceived to have a bigger chance of being bailed out by multilateral organizations.

creation, net employment growth and productivity and raising destruction. On the other hand, increases in non-wage labor costs lead to bigger job destruction and reallocation and to smaller net employment growth and productivity. Finally, the most common response to higher sectoral tariffs is to raise job destruction, reallocation and productivity and reduce net employment growth.

The presence of institutional features and policies that lead to an excessive bargaining power of workers, to low openness to trade and to large reliance on banking credit affects the nature of the responses of job flows and productivity to cyclical and policy shocks in ways that may reduce the efficiency of the restructuring process. Industries with bigger access to banking credit are more hard hit by financial shocks, but are are able to raise more their net employment growths in response to reductions in non-wage labor costs and sectoral tariff hikes. The presence of workers with larger bargaining power leads to bigger declines in job creation, net employment growth and job reallocation in response to negative profitability shocks, suggesting that they contribute to bigger labor market sclerosis. More open industries restructure more and experience smaller productivity declines in response to negative profitability shocks, suggesting that they have a bigger ability to hedge against domestic recessions and that they are more inmune to adverse shocks to the cost of capital because of their bigger access to foreign credit. These sectors raise net employment growth more when non-wage labor costs are reduced.

Most negative profitability shocks (except for the shocks to non-wage labor costs) and the sectoral tariff hikes are usually met by a combination of reduced reallocation and productivity in a majority of industries, although there is quite a high degree of heterogeneity in the responses across industries. Our VAR analysis allows us to assess the relative contribution of reallocation to productivity through the analysis of the responses of productivity to the different shocks when the responses of job flows are shut-off. This analysis shows that increased reallocation within the manufacturing sector as a whole is seen to contribute to bigger increases (or smaller declines) in productivity in response to the different shocks. Although a majority of industries also display a positive contribution of reallocation to productivity in response to most shocks, there is substantial heterogeneity of behavior at this level.

Economic reforms in general are seen to have affected the nature of job flows across time and across sectoral characteristics. There appears to have occurred an important structural break during 1995, associated to the implementation of Mercosur, the conclusion of privatizations, the restructuring of the banking sector and the bigger access to banking credit, and the relatively more flexible labor market regulations. After 1995 job reallocation was bigger, job creation was more synchronized with job destruction and net employment growth was bigger, which would be consistent with the view that the post-1995 reforms made this period more flexible. Additionally, during the 1991-1994 sub-period the biggest establishments were more hard hit and displayed the largest job destruction rates, the smallest creation rates and the third largest reallocation rates, which can be tied to the privatization process. On the other hand, during the 1997-2001 sub-period the largest production units seemed to better fit to accommodate negative shocks, displaying destruction and reallocation rates that were significantly lower than those of other sizes, suggesting that the restructuring that the 91-94 reforms provoked in large firms made them more resilient to adverse shocks, while the more flexible environment after 1995 induced bigger reallocation by the smaller establishments. The post-1995 reforms and policy and institutional environment also favored the performance of establishments operating in industries with high export shares, which declined their destruction and reallocation rates, and increased their creation and net employment growth rates. The opposite happened to the establishments in low export share industries. Mercosur, increased access to banking and a relatively more flexible labor market appear to have favored those establishments with a bigger propensity to export.

Tests for subsample instability confirm that there was a structural break in the VAR coefficients for most equations. The comparison of the impulse response functions for 1995-2001 and for 1991-2001 yields that after 1995 destruction tends to rise more in response to these negative profitability shocks, pressumably reflecting the more flexible labor regulations. This bigger labor market flexibility also appears to have led to a bigger synchronization of creation and destruction in response to NWLC shocks. Another important finding is that after 1995 adverse shocks to the cost of capital are met with bigger declines in reallocation and in net employment growth that are consistent with the balance sheet effects of a larger reliance on banking credit that outweigh the pro-reallocation effects of the more flexible labor regulations. The bigger sensitivity to losses of international competitiveness due to Mercosur may have also contributed to this larger vulnerability to adverse financial shocks.

Table 1: Job Flows 1990-2001

Annual Job Flows - Total

	Net Growth	Job Creation	Job Destruction	Job Reallocation	Excess Reallocation	Min Wk Reallocation
Mean	-4.1	5.3	9.4	14.6	10.5	5.3
Max	0.5	8.4	12.8	17.9	16.0	8.0
Min	-8.8	3.0	5.3	10.5	6.1	3.0
Median	-4.8	5.2	9.4	14.8	10.4	5.2
Std. Dev.	2.7	1.4	1.9	1.9	2.7	1.3

Table 2: Job Flows by firm size

Annual Job Flows - Size Classification - Initial size

Size	Net Growth	Job Creation	Job Destruction	Job Reallocation	Excess Reallocation	Min Wk Reallocation
Less than 50	-3.5	7.2	10.8	18.0	12.9	6.4
51-100	-3.7	5.7	9.4	15.1	10.5	5.2
101-150	-2.9	5.8	8.7	14.4	10.3	5.2
151-300	-3.6	4.6	8.3	12.9	9.1	4.5
301 and more	-4.7	3.8	8.5	12.3	7.3	3.7

Table 3: Tariff Structure

	Oct '89	Dec '89	Apr '90	Jan '91	Apr '91	Jun '95	Dec '98	Nov '00	May '01
Average Tariff	26,5	20,7	16,2	18,2	9,7	16,7	14,0	16,1	13,3
Std Deviation	12,9	10,6	8,4	8,4	9,5	6,3	6,8	7,6	8,6
Max	40,0	30,0	24,0	22,0	22,0	34,0	33,0	33,7	35,0
Min	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

Source: IERAL, based on CEA (1995) and UNCTAD-TRAINS.

Table 4: Aggregate Variance Decomposition

Variable	Period of forecast	Contributors				
		TOT	Aggragate Shocks	Productivity	Cost of Capital	NWLC
Aggregate creation	4	14.1	36.6	14.9	33.9	0.6
	8	11.3	23.6	20.6	43.7	0.8
	16	11.3	23.6	20.6	43.7	0.8
Aggregate destruction	4	2.9	45.5	24.3	25.6	1.8
	8	2.9	43.3	23.1	28.4	2.2
	16	2.9	43.3	23.1	28.4	2.2
Productivity	4	4.3	3.8	74.7	16.9	0.3
	8	5.2	5.6	63.3	25.6	0.3
	16	5.2	5.6	63.3	25.6	0.3

Note: TOT = Terms of Trade ; NWLC = Non - Wage Labor Costs

Table 5: ***Contribution of shocks to Forecast Error Variance of Sectoral Gross Job. Flows and Productivity***

	Period of forecast	Contributors							
		TOT	Aggragate Shocks	Productivity	Cost of Capital	NWLC	Tariffs	Sectoral shocks	Sectoral Productivity
Creation	4	4.4%	18.9%	14.1%	5.6%	6.9%	5.5%	39.9%	4.8%
	8	5.9%	13.0%	11.1%	3.5%	3.4%	7.8%	49.0%	6.3%
	16	4.4%	24.3%	18.5%	7.3%	7.5%	5.4%	27.1%	5.5%
Destruction	4	5.5%	23.3%	18.1%	8.2%	4.7%	4.5%	32.6%	3.1%
	8	6.2%	22.8%	14.2%	7.5%	0.4%	5.9%	38.8%	4.2%
	16	4.7%	25.6%	19.1%	8.5%	6.1%	4.9%	26.9%	4.2%
Productivity	4	3.8%	9.9%	40.6%	5.1%	6.8%	5.8%	8.0%	20.1%
	8	4.7%	1.2%	61.1%	3.8%	0.9%	5.2%	8.7%	14.4%
	16	3.6%	20.5%	41.8%	4.5%	7.5%	5.5%	6.1%	10.4%

Note: TOT = Terms of Trade ; NWLC = Non - Wage Labor Costs

Table 6: ***Summary of industry - level impulse - response functions***

Shocks:	Terms of Trade		Aggregate Productivity		User Cost of Capital		NWLC		Tariffs		Sectoral Productivity	
	Short Run	Long Run	Short Run	Long Run	Short Run	Long Run	Short Run	Long Run	Short Run	Long Run	Short Run	Long Run
% Positive Productivity	50.0%	50.0%	100.0%	80.0%	15.0%	25.0%	35.0%	40.0%	30.0%	30.0%	95.0%	90.0%
% Nul Productivity	0.0%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% Positive Creation	20.0%	20.0%	90.0%	70.0%	15.0%	15.0%	50.0%	50.0%	30.0%	35.0%	45.0%	55.0%
% Nul Creation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.0%	0.0%	0.0%	0.0%	0.0%	5.0%
% Positive Destruction	45.0%	45.0%	20.0%	65.0%	65.0%	50.0%	80.0%	65.0%	45.0%	40.0%	30.0%	35.0%
% Nul Destruction	0.0%	0.0%	0.0%	0.0%	0.0%	10.0%	0.0%	0.0%	5.0%	0.0%	0.0%	0.0%
% Equal sign of C & D	55.0%	40.0%	30.0%	60.0%	40.0%	50.0%	60.0%	50.0%	45.0%	40.0%	35.0%	45.0%
%Absolute Value of C < D	60.0%	65.0%	35.0%	65.0%	60.0%	45.0%	70.0%	75.0%	60.0%	60.0%	75.0%	70.0%
% Positive Net Growth	40.0%	55.0%	85.0%	45.0%	15.0%	25.0%	25.0%	40.0%	40.0%	45.0%	65.0%	65.0%
% Nul Net Growth	5.0%	45.0%	5.0%	55.0%	5.0%	75.0%	5.0%	60.0%	5.0%	55.0%	0.0%	35.0%
% Positive Gross Reallocation	30.0%	20.0%	60.0%	60.0%	35.0%	30.0%	85.0%	75.0%	40.0%	35.0%	30.0%	35.0%
% Nul Gross Reallocation	0.0%	80.0%	0.0%	40.0%	0.0%	70.0%	0.0%	25.0%	15.0%	65.0%	15.0%	65.0%

N.B. Nul productivitiy is change in productivity below 0,1 in absolute value. Nul creation and nul dsetruction are changes below 0,01 in absolute value.

Table 7: Summary statistics for Industry-Level Shock Response Regressions

Dependent Variables: - Cumulative 7-steps Employment Responses

- Cumulative 15-steps Reallocation Responses
- Cumulative 15-steps Productivity Responses

Sample size, N=20

Linear Specification

p-value between parentheses

Cost of Capital

	Employment				Reallocation				Productivity			
	1	2	3	4	1	2	3	4	1	2	3	4
Labor-Intensity	-0.156	-0.176	-0.087	-0.237	-0.073	-0.136	-0.014	-0.230	-1.355	-1.591	-1.340	-1.688
	(0.135)	(0.112)	(0.135)	(0.120)	(0.294)	(0.259)	(0.241)	(0.271)	(1.769)	(1.730)	(1.624)	(1.822)
Access to Credit	-0.213	-0.276	-0.009	-0.244	-0.130	-0.325	0.038	-0.291	0.589	-0.133	0.605	0.125
	(0.197)	(0.163)	(0.178)	(0.164)	(0.429)	(0.376)	(0.317)	(0.369)	(2.583)	(2.507)	(2.136)	(2.481)
Workers Strength	-0.119	-0.114	-0.062	-0.118	-0.124	-0.135	-0.045	-0.143	0.420	0.346	0.593	0.356
	(0.079)	(0.066)	(0.081)	(0.068)	(0.173)	(0.152)	(0.144)	(0.152)	(1.044)	(1.012)	(0.970)	(1.023)
Degree of Opennes		0.028				0.040				0.087		
		(0.007)				(0.017)				(0.112)		
Export Share			0.077				0.181				0.601	
			(0.037)				(0.066)				(0.442)	
Import Penetration				0.140				0.207				0.355
				(0.039)				(0.087)				(0.588)
Sectoral Trade Balance	-0.023				-0.022				-0.019			
	(0.010)				(0.021)				(0.127)			

Terms of Trade

	Employment				Reallocation				Productivity			
	1	2	3	4	1	2	3	4	1	2	3	4
Labor-Intensity	-0.058	-0.064	-0.016	-0.108	-0.193	-0.198	-0.130	-0.248	-2.229	-2.356	-2.160	-2.393
	(0.0869)	(0.080)	(0.0922	(0.079)	(0.139)	(0.133)	(0.148)	(0.138)	(1.635)	(1.612)	(1.558)	(1.696)
Access to Credit	-0.085	-0.105	0.039	-0.108	-0.080	-0.098	0.107	-0.082	0.580	0.189	0.770	0.440
	(0.1874)	(0.116)	(0.121)	(0.107)	(0.203)	(0.192)	(0.195)	(0.188)	(2.387)	(2.336)	(2.049)	(2.310)
Workers Strength	-0.111	-0.106	-0.081	-0.111	-0.112	-0.103	-0.070	-0.108	0.515	0.485	0.646	0.502
	(0.0513)	(0.047)	(0.055)	(0.044)	(0.082)	(0.078)	(0.088)	(0.078)	(0.965)	(0.943)	(0.931)	(0.952)
Degree of Opennes		0.015				0.021				0.065		
		(0.005)				(0.009)				(0.105)		
Export Share			0.031				0.037				0.347	
			(0.025)				(0.040)				(0.425)	
Import Penetration				0.085				0.108				0.235
				(0.025)				(0.044)				(0.547)
Sectoral Trade Balance	-0.013				-0.020				-0.030			
	(0.0062)				(0.010)				(0.117)			

Non-wage Labor Cost

	Employment				Reallocation				Productivity			
	1	2	3	4	1	2	3	4	1	2	3	4
Labor-Intensity	0.019	0.019	0.011	0.028	0.089	0.085	0.064	0.102	1.285	1.369	1.308	1.420
	(0.041)	(0.041)	(0.041)	(0.042)	(0.093)	(0.093)	(0.094)	(0.097)	(1.312)	(1.305)	(1.261)	(1.363)
Access to Credit	0.007	0.009	-0.016	0.011	0.034	0.024	-0.041	0.023	-0.758	-0.502	-0.679	-0.525
	(0.060)	(0.059)	(0.053)	(0.057)	(0.135)	(0.135)	(0.124)	(0.132)	(1.916)	(1.891)	(1.658)	(1.857)
Workers Strength	-0.004	-0.005	-0.009	-0.004	0.027	0.022	0.015	0.024	-0.210	-0.179	-0.254	-0.175
	(0.024)	(0.024)	(0.024)	(0.024)	(0.055)	(0.055)	(0.056)	(0.054)	(0.774)	(0.763)	(0.753)	(0.765)
Degree of Opennes		-0.002				-0.006				-0.023		
		(0.003)				(0.006)				(0.085)		
Export Share			-0.004				0.000				-0.204	
			(0.011)				(0.026)				(0.344)	
Import Penetration				-0.015				-0.035				-0.116
				(0.014)				(0.031)				(0.440)
Sectoral Trade Balance	0.002				0.007				-0.002			
	(0.003)				(0.007)				(0.094)			

Tariff

	Employment				Reallocation				Productivity			
	1	2	3	4	1	2	3	4	1	2	3	4
Labor-Intensity	0.103	0.102	0.060	0.132	0.111	0.092	0.061	0.114	-0.697	-0.826	-0.731	-0.797
	(0.067)	(0.065)	(0.079)	(0.068)	(0.117)	(0.123)	(0.122)	(0.128)	(0.686)	(0.670)	(0.598)	(0.711)
Access to Credit	0.119	0.118	-0.009	0.107	0.125	0.069	-0.029	0.065	0.177	-0.216	0.059	-0.001
	(0.098)	(0.094)	(0.104)	(0.093)	(0.170)	(0.178)	(0.160)	(0.175)	(1.002)	(0.970)	(0.786)	(0.969)
Workers Strength	0.063	0.056	0.037	0.058	0.086	0.071	0.067	0.073	0.453	0.406	0.522	0.427
	(0.040)	(0.038)	(0.047)	(0.038)	(0.069)	(0.072)	(0.073)	(0.072)	(0.405)	(0.392)	(0.357)	(0.399)
Degree of Opennes		-0.013				-0.009				0.035		
		(0.04)				(0.008)				(0.043)		
Export Share			-0.015				0.028				0.312	
			(0.022)				(0.033)				(0.163)	
Import Penetration				-0.065				-0.046				0.082
				(0.022)				(0.041)				(0.229)
Sectoral Trade Balance	0.013				0.015				0.003			
	(0.005)				(0.008)				(0.049)			

Aggregate Productivity

	Employment				Reallocation				Productivity			
	1	2	3	4	1	2	3	4	1	2	3	4
Labor-Intensity	0.251	0.263	0.171	0.311	0.411	0.399	0.321	0.419	2.454	2.625	2.352	2.668
	(0.128)	(0.112)	(0.143)	(0.128)	(0.233)	(0.235)	(0.246)	(0.254)	(3.206)	(3.179)	(3.088)	(3.333)
Access to Credit	0.249	0.287	0.010	0.233	0.085	0.052	-0.187	-0.026	-0.470	0.054	-0.757	-0.309
	(0.187)	(0.162)	(0.188)	(0.175)	(0.340)	(0.340)	(0.323)	(0.346)	(4.682)	(4.607)	(4.061)	(4.540)
Workers Strength	0.056	0.046	-0.002	0.047	0.011	-0.007	-0.037	-0.012	-0.526	-0.487	-0.708	-0.512
	(0.076)	(0.065)	(0.086)	(0.072)	(0.137)	(0.137)	(0.147)	(0.142)	(1.892)	(1.859)	(1.845)	(1.872)
Degree of Opennes		-0.028				-0.023				-0.091		
		(0.007)				(0.015)				(0.206)		
Export Share			-0.0601				-0.005				-0.470	
			(0.039)				(0.067)				(0.841)	
Import Penetration				-0.131				-0.088				-0.318
				(0.041)				(0.082)				(1.075)
Sectoral Trade Balance	0.260				0.028				0.043			
	(0.009)				(0.017)				(0.230)			

Sectoral Productivity

	Employment				Reallocation				Productivity			
	1	2	3	4	1	2	3	4	1	2	3	4
Labor-Intensity	-0.055	-0.048	-0.043	-0.040	-0.083	-0.040	-0.059	-0.008	1.710	2.031	1.830	1.998
	(0.047)	(0.048)	(0.045)	(0.050)	(0.242)	(0.240)	(0.216)	(0.249)	(2.620)	(2.595)	(2.443)	(2.725)
Access to Credit	0.031	0.053	0.069	0.072	-0.035	0.095	0.040	0.109	-0.962	0.017	-0.560	-0.405
	(0.068)	(0.070)	(0.059)	(0.069)	(0.354)	(0.347)	(0.284)	(0.339)	(3.826)	(3.760)	(3.212)	(3.712)
Workers Strength	0.024	0.028	0.026	0.030	0.007	0.025	-0.008	-0.029	-1.002	-0.878	-1.150	-0.916
	(0.028)	(0.028)	(0.027)	(0.283)	(0.143)	(0.140)	(0.129)	(0.140)	(1.546)	(1.518)	(1.460)	(1.530)
Degree of Opennes		0.001				-0.008				-0.077		
		(0.003)				(0.016)				(0.168)		
Export Share			-0.014				-0.099				-0.765	
			(0.012)				(0.059)				(0.665)	
Import Penetration				-0.004				-0.053				-0.206
				(0.016)				(0.080)				(0.879)
Sectoral Trade Balance	-0.003				-0.005				-0.018			
	(0.003)				(0.017)				(0.188)			

Table 8: Percentage of industries where reallocation raises productivity

Shocks to:	Aggregate and sectoral	Sectoral only
Terms of Trade	55%	50%
Cost of Capital	55%	65%
Non wage labor cost	65%	45%
Sectoral Tariff	50%	50%

Table 9: Job Flows by sub period

	Job Creation	Job Destruction	Net Growth	Job Reallocation
Average 91-94	5.18	9.33	-4.15	14.50
Coef. Variation 91-94	0.29	0.04	-0.39	0.10
Average 95-01	6.09	9.37	-3.29	15.46
Coef. Variation 95-01	0.25	0.22	-0.70	0.18

Table 10: Job Flows and Establishment Size

Initial Size - Annual rates between quarters

Annual averages

Job Creation

	91-01	91-94	97-01
Less than 50	7.2	8.3	6.9
51-100	5.7	6.2	5.5
101-150	5.8	5.3	6.0
151-300	4.6	4.6	5.3
301 and more	3.8	2.8	5.1

Job Destruction

	91-01	91-94	97-01
Less than 50	10.8	7.5	13.4
51-100	9.4	8.9	9.6
101-150	8.7	8.0	9.3
151-300	8.3	8.3	8.1
301 and more	8.5	11.6	6.7

Job Reallocation

	91-01	91-94	97-01
Less than 50	18.0	15.7	20.3
51-100	15.1	15.1	15.1
101-150	14.4	13.3	15.3
151-300	12.9	12.9	13.4
301 and more	12.3	14.4	11.8

Table 11: Job flows by exposure to trade. Different sub-periods

Job Flows - Annual rates between quarters - Annual averages

	Job Creation		Job Destruction		Job Reallocation		Net Growth	
Export Share								
	91-94	**95-01**	**91-94**	**95-01**	**91-94**	**95-01**	**91-94**	**95-01**
Low	6,1	5,9	8,1	9,4	14,2	15,3	-2,0	-3,5
Medium	4,4	4,8	10,2	9,8	14,6	14,6	-5,9	-4,9
High	5,3	5,5	9,3	8,5	14,6	14,1	-4,0	-3,0
Import Penetration								
	91-94	**95-01**	**91-94**	**95-01**	**91-94**	**95-01**	**91-94**	**95-01**
Low	5,4	5,8	9,6	9,6	15,1	15,3	-4,2	-3,8
Medium	5,0	4,9	8,5	8,9	13,5	13,8	-3,5	-3,9
High	4,7	5,0	9,8	9,8	14,5	14,9	-5,1	-4,8

Table 12: Tests for Structural Break in 1995

Equation	Constant and Variable:						All
	TT	*Creation*	*Destruction*	*Pruductivity*	*CK*	*Tax*	
TT	91.9%	86.0%	91.2%	94.3%	68.7%	85.7%	57.2%
Creation	4.9%	6.3%	4.6%	5.3%	4.5%	4.5%	3.8%
Destruction	78.9%	88.0%	72.7%	76.2%	58.8%	84.1%	16.6%
Productivity	100.0%	100.0%	99.9%	100.0%	78.0%	98.5%	17.8%
CK	23.1%	82.2%	8.0%	28.0%	4.4%	13.1%	1.8%
Tax	0.1%	0.1%	0.1%	0.0%	0.0%	0.1%	0.0%

Table 13

Aggregate Variance Decomposition (95-01)

Variable	Period of forecast	Contributors				
		TT	Aggregate Shocks	Productivity	Cost of Capital	NWLC
Aggregate creation	4	8.4	26.5	18.1	45.5	1.5
	8	12.6	21.7	17.8	46.8	1.0
	16	11.3	23.6	20.6	43.7	0.8
Aggregate destruction	4	2.0	48.0	24.8	19.3	5.8
	8	5.6	34.5	34.5	21.6	3.9
	16	2.9	43.3	23.1	28.4	2.2
Productivity	4	4.0	6.9	72.6	16.5	0.0
	8	9.7	6.1	65.1	19.1	0.1
	16	5.2	5.6	63.3	25.6	0.3

Figure 1: Aggregate Manufacturing Gross and Net Job Flows

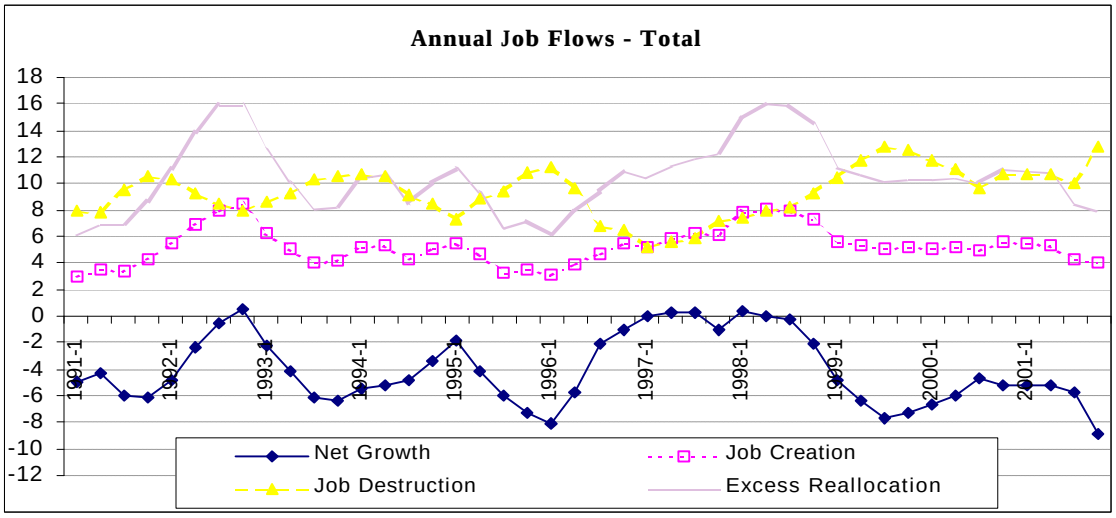
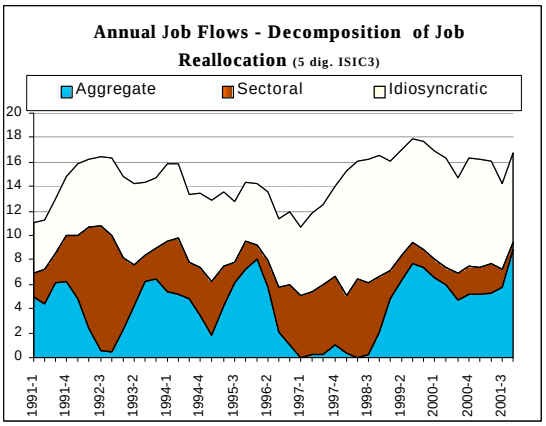


Figure 2: Aggregate Reallocation Decomposition



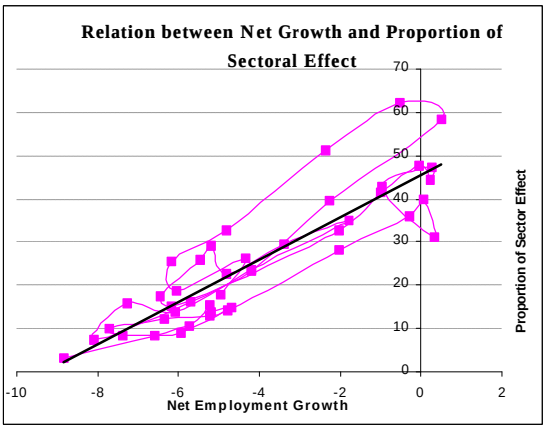


Figure 3: Annual Manufacturing Labor Productivity Growth Rates

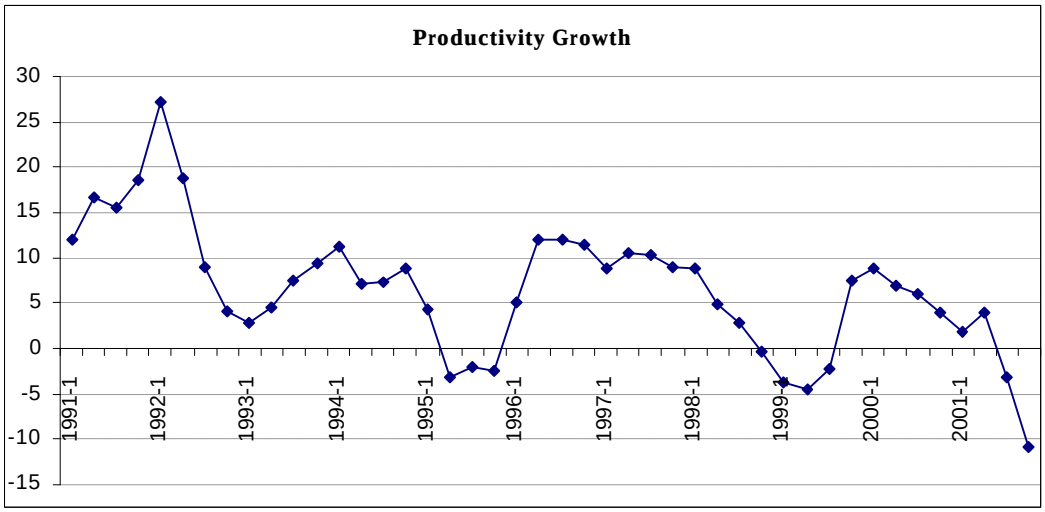


Figure 4

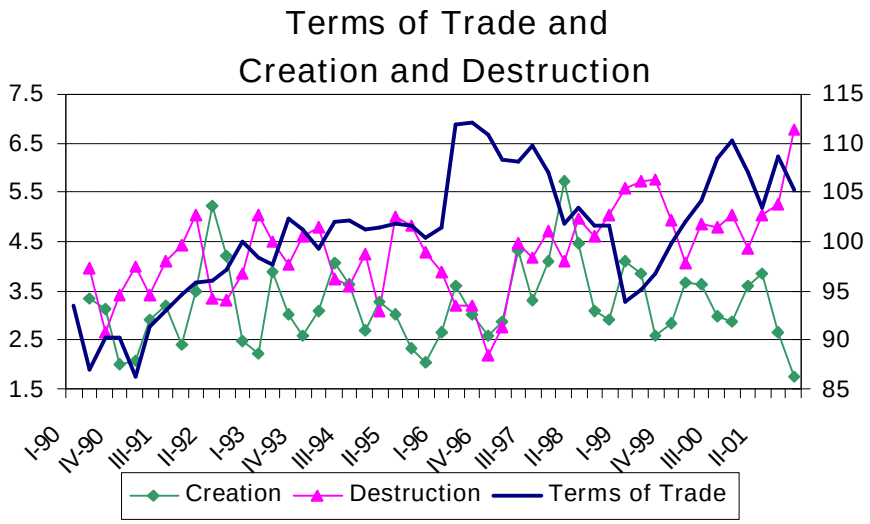


Figure 5

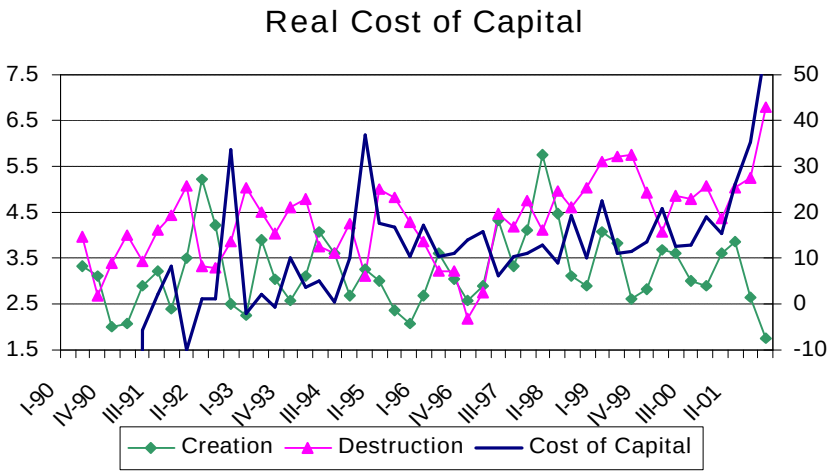


Figure 6

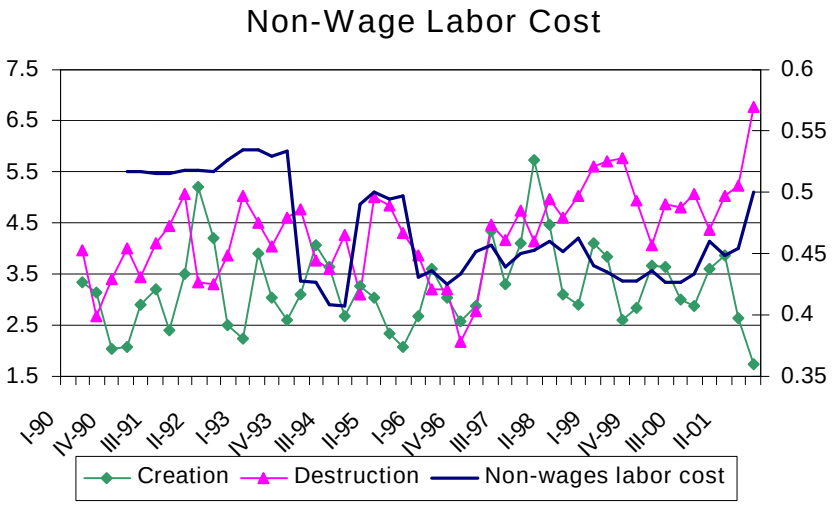


Figure 7

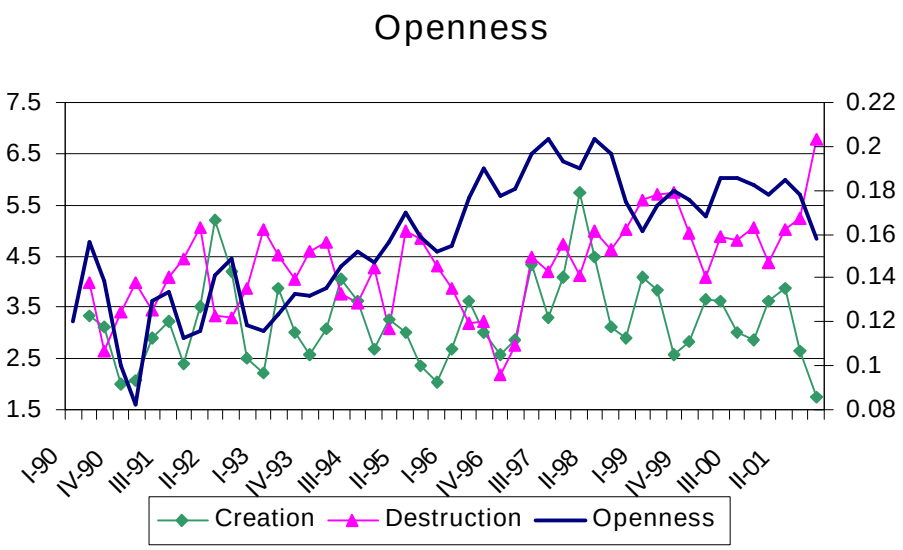
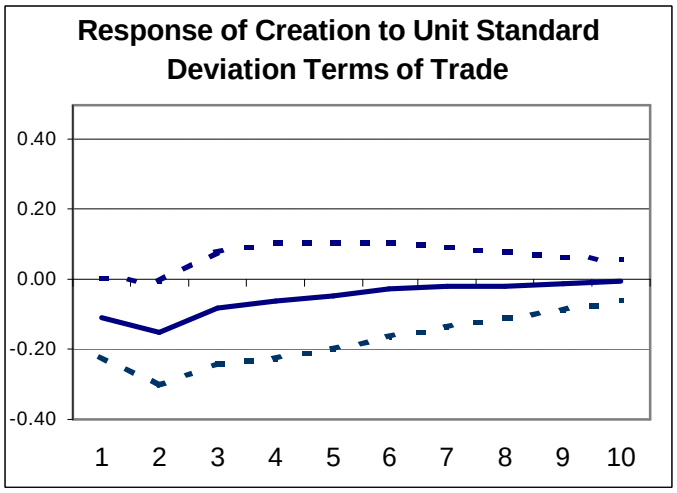
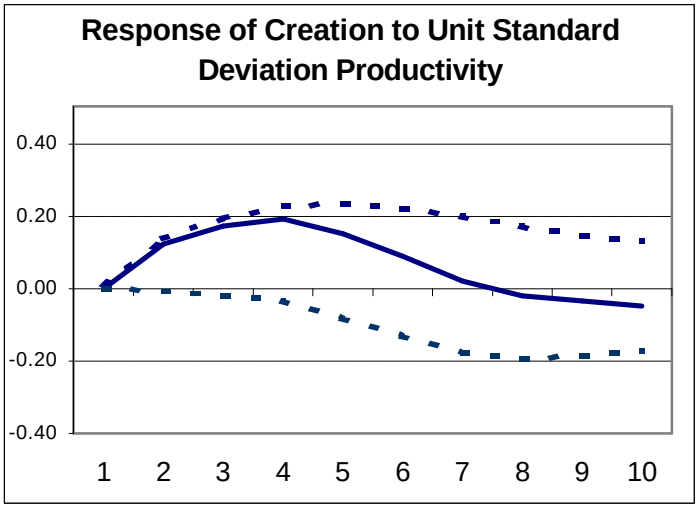
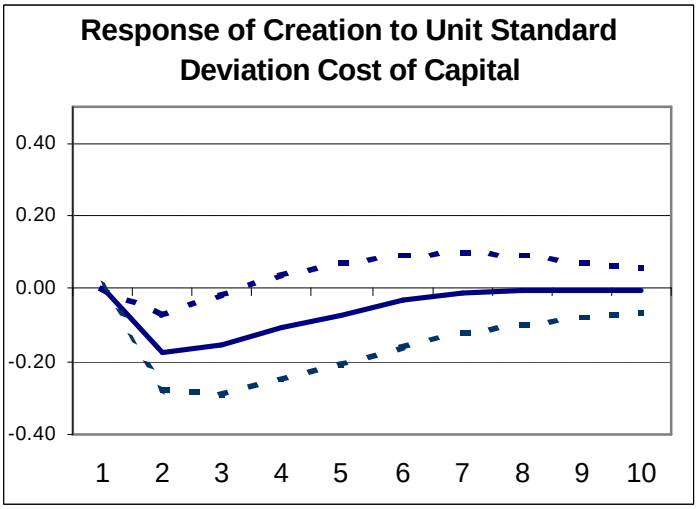
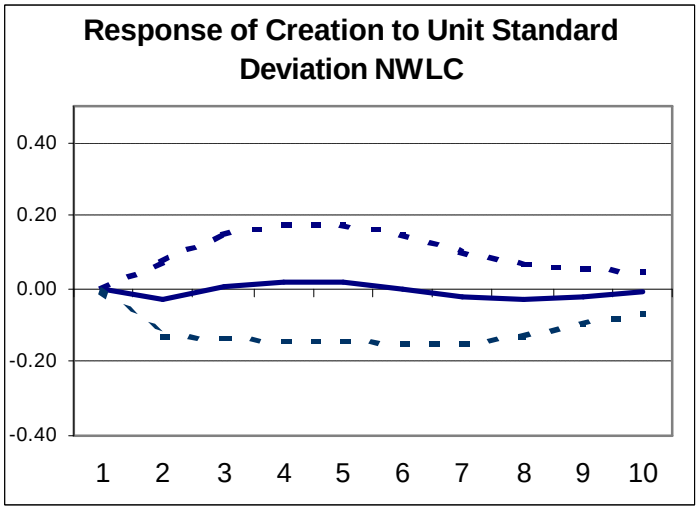

Openness
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.22
0.2
0.18
0.16
0.14
0.12
0.1
0.08
I-90
IV-90
III-91
II-92
I-93
IV-93
III-94
II-95
I-96
IV-96
III-97
II-98
I-99
IV-99
III-00
II-01
Creation
Destruction
Openness

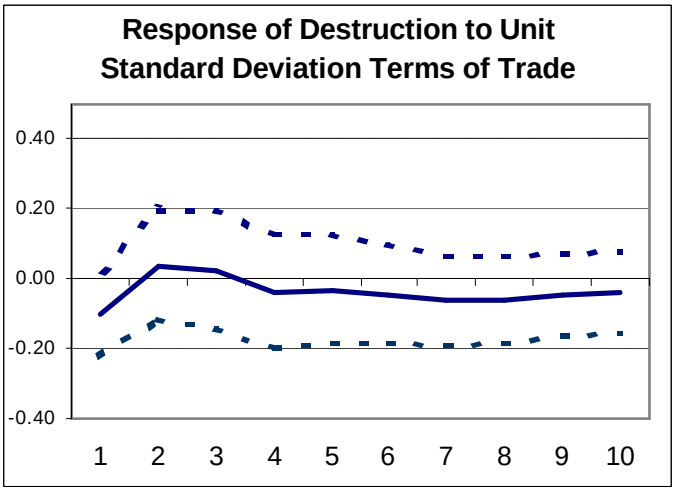
Figure 8: : Impulse Response Function for Total Manufacturing, Five-Variable Subsystem







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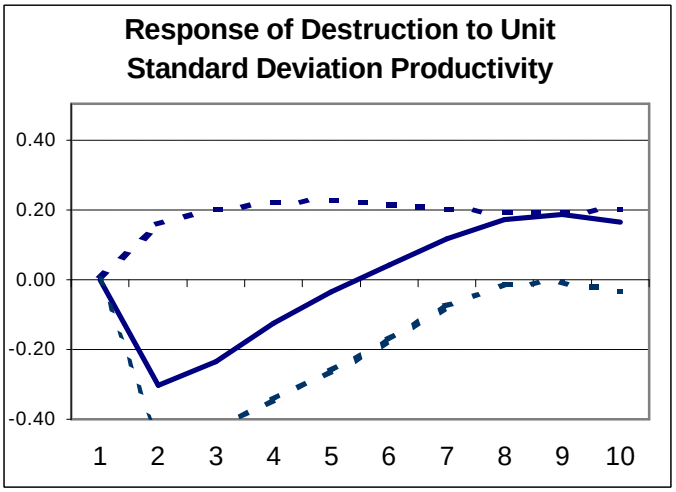
0.20
0.00
-0.20
-0.40
1 2 3 4 5 6 7 8 9 10


Response of Destruction to Unit Standard Deviation Productivity
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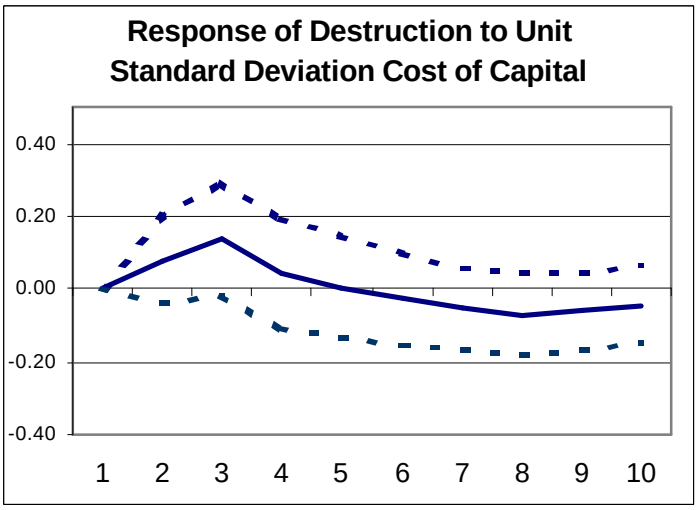
0.20
0.00
-0.20
-0.40
1 2 3 4 5 6 7 8 9 10


Response of Destruction to Unit Standard Deviation Cost of Capital
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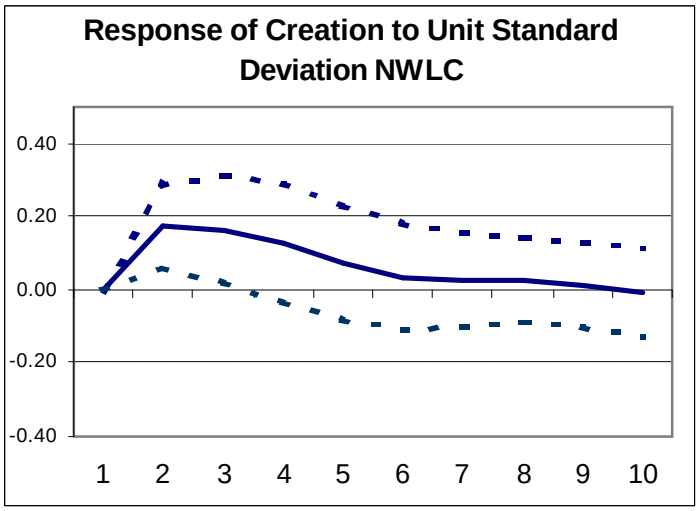
0.00
-0.20
-0.40
1 2 3 4 5 6 7 8 9 10


Response of Creation to Unit Standard Deviation NWLC
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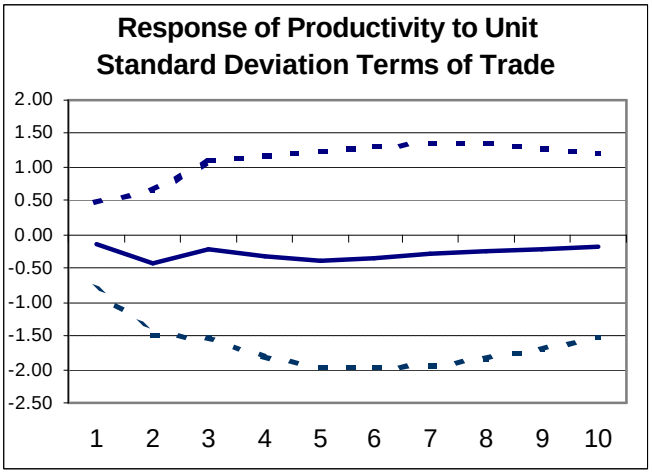
0.20
0.00
-0.20
-0.40
1 2 3 4 5 6 7 8 9 10


Response of Productivity to Unit Standard Deviation Terms of Trade
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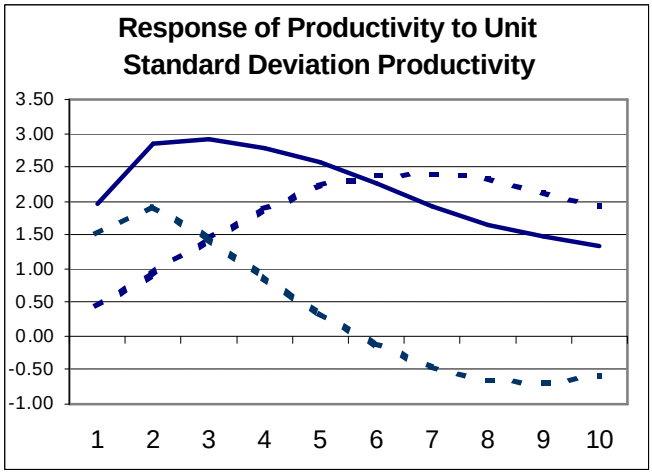
1.50
1.00
0.50
0.00
-0.50
-1.00
-1.50
-2.00
-2.50
1 2 3 4 5 6 7 8 9 10


Response of Productivity to Unit Standard Deviation Productivity
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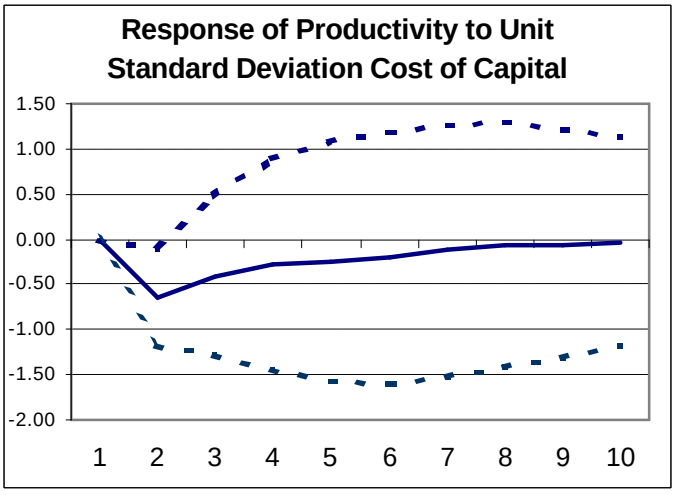
3.00
2.50
2.00
1.50
1.00
0.50
0.00
-0.50
-1.00
1 2 3 4 5 6 7 8 9 10


Response of Productivity to Unit Standard Deviation Cost of Capital
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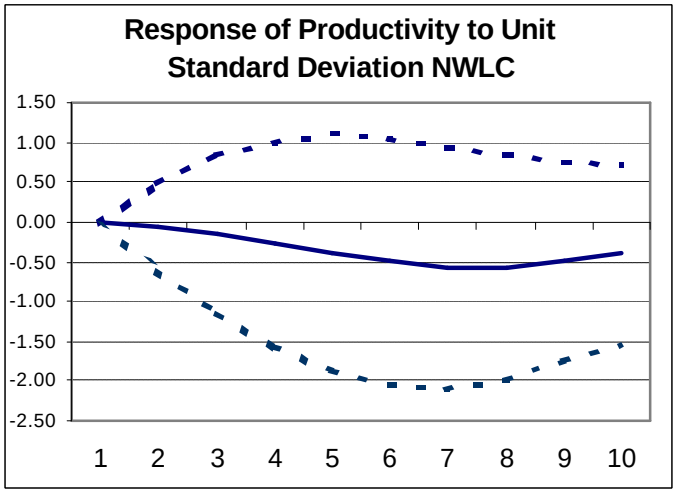
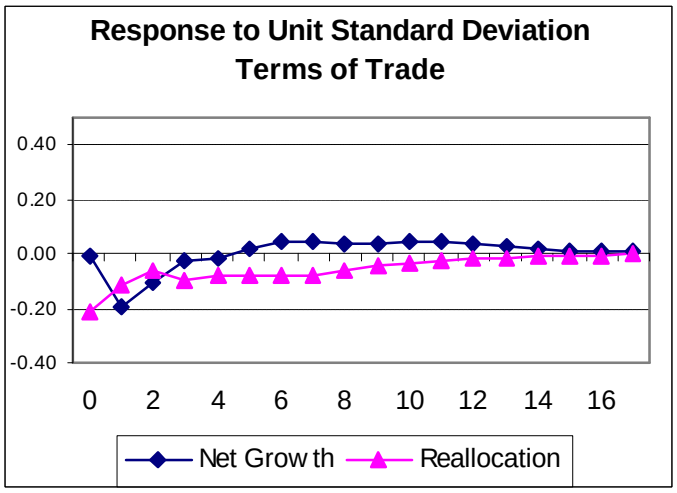
0.50
0.00
-0.50
-1.00
-1.50
-2.00
1 2 3 4 5 6 7 8 9 10


Response of Productivity to Unit Standard Deviation NWLC
1.50
1.00
0.50
0.00
-0.50
-1.00
-1.50
-2.00
-2.50
1 2 3 4 5 6 7 8 9 10


Response to Unit Standard Deviation
Terms of Trade
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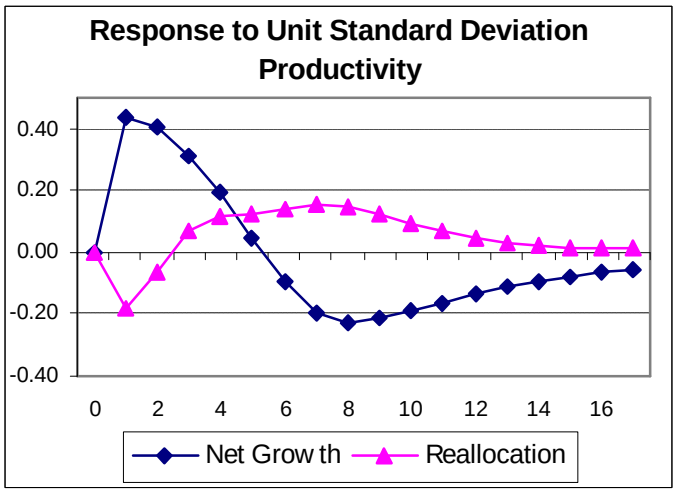
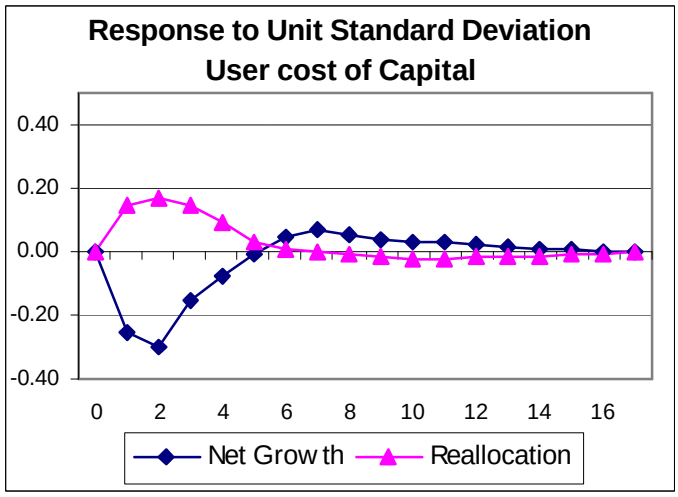
0.20
0.00
-0.20
-0.40
0 2 4 6 8 10 12 14 16
Net Grow th
Reallocation


Response to Unit Standard Deviation
Productivity
0.40
0.20
0.00
-0.20
-0.40
0 2 4 6 8 10 12 14 16
Net Grow th
Reallocation


Response to Unit Standard Deviation
User cost of Capital
0.40
0.20
0.00
-0.20
-0.40
0 2 4 6 8 10 12 14 16
Net Grow th
Reallocation

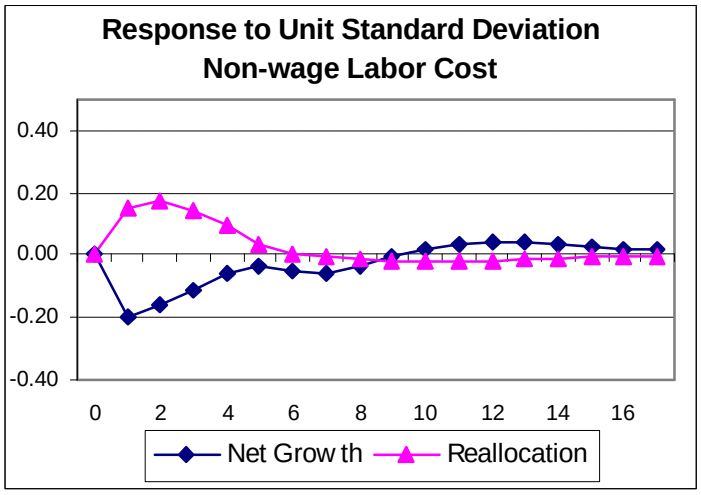
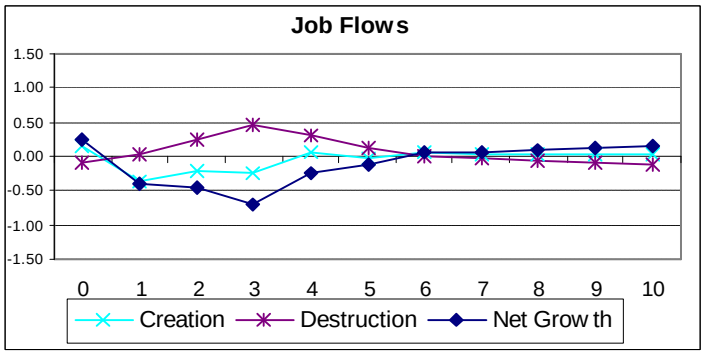
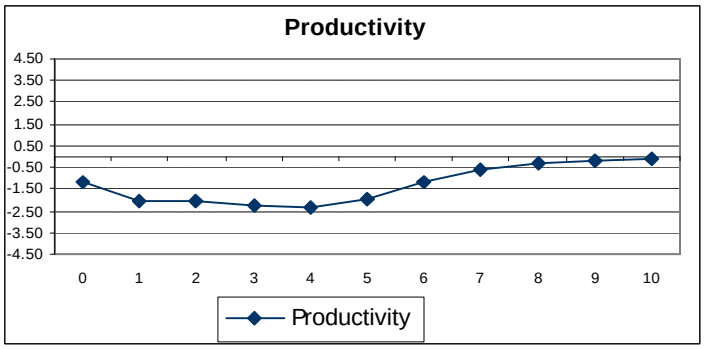

Response to Unit Standard Deviation
Non-wage Labor Cost
0.40
0.20
0.00
-0.20
-0.40
0 2 4 6 8 10 12 14 16
Net Grow th
Reallocation

Figure 9: Impulse Response Function, Selected Sectors

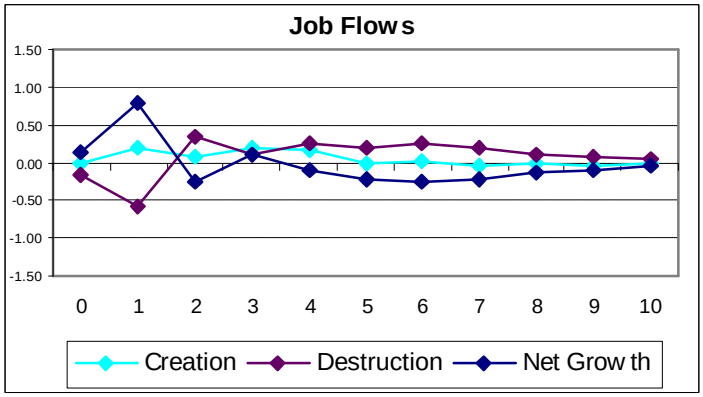
20) Wood and Products of Wood

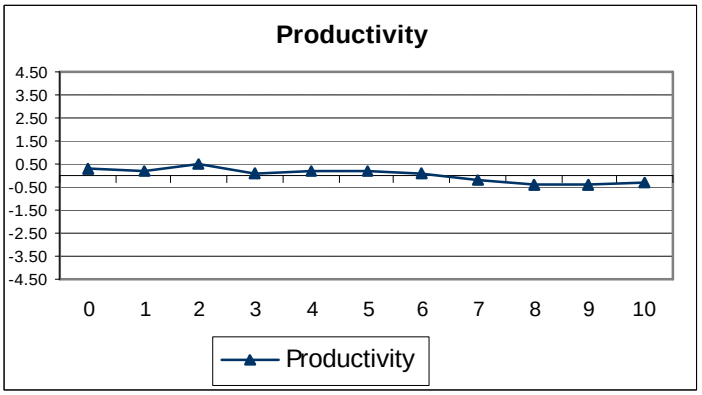
Response to Unit Cost of Capital Shock



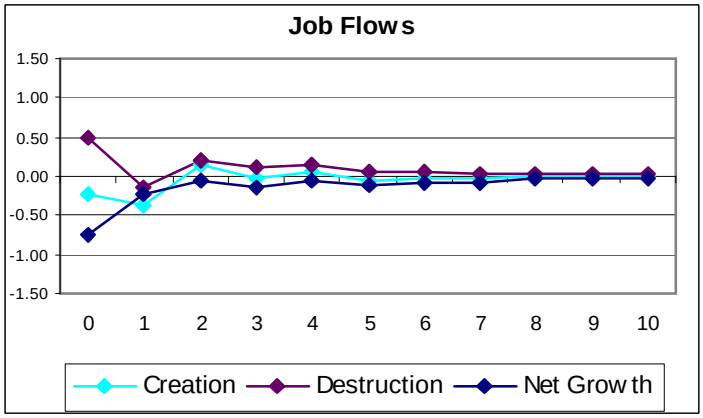


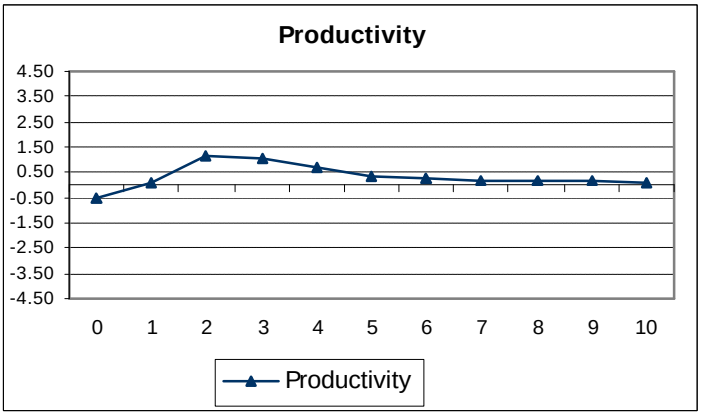
Response to Unit Non-Wage Labor Cost Shock





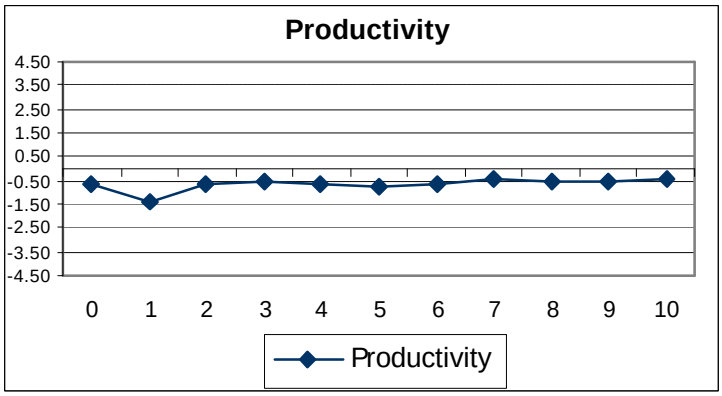
Response to Unit Tariff Shock



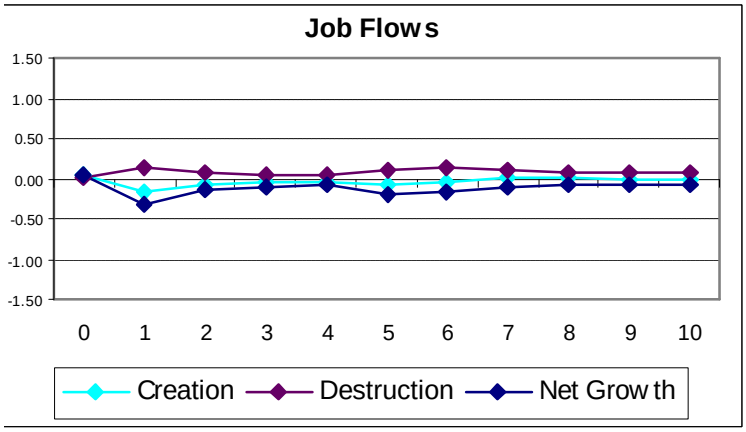


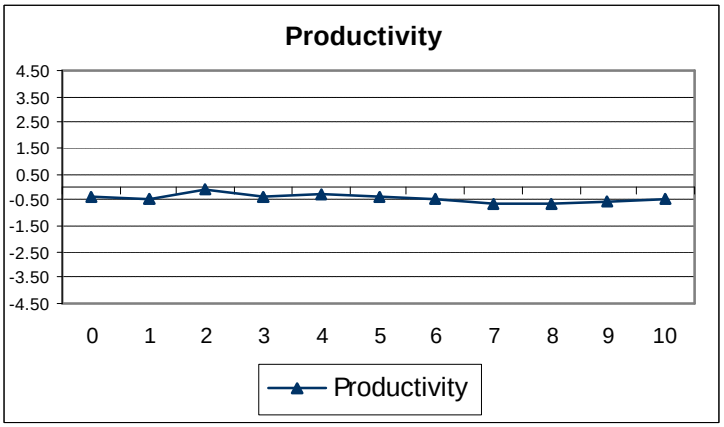
(24) Chemicals and Chemical Products

Response to Unit Cost of Capital Shock

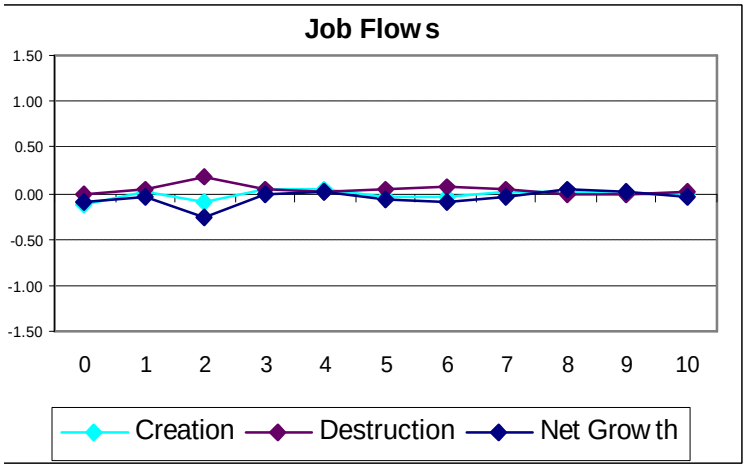


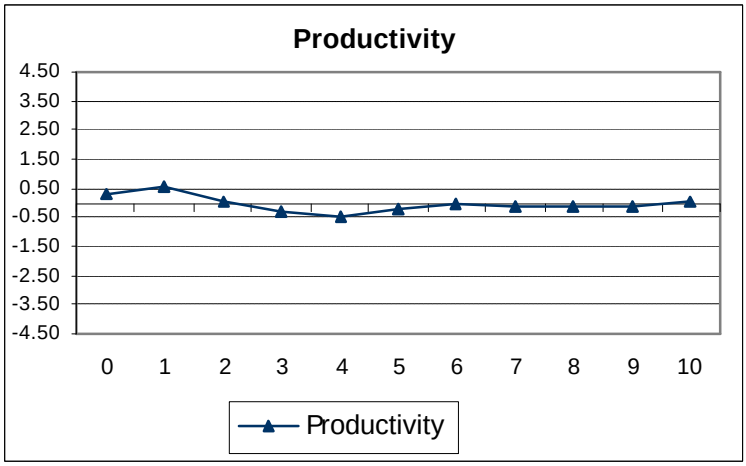
Response to Unit Non-Wage Labor Cost Shock





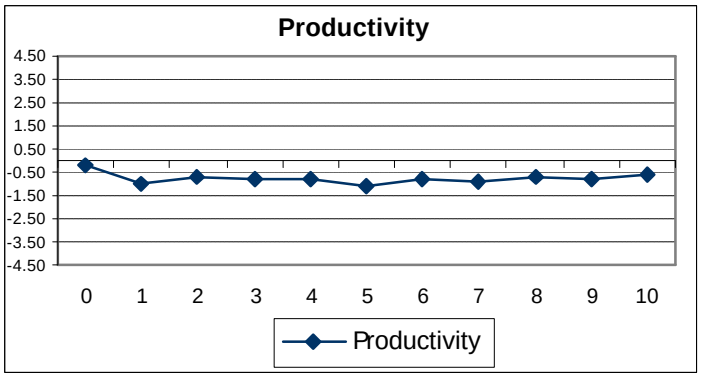
Response to Unit Tariff Shock



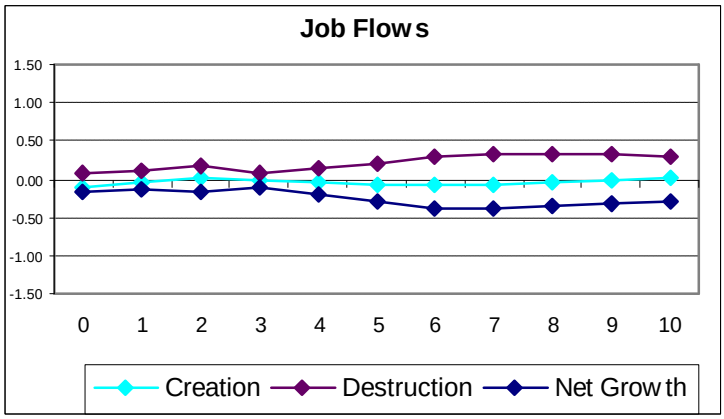


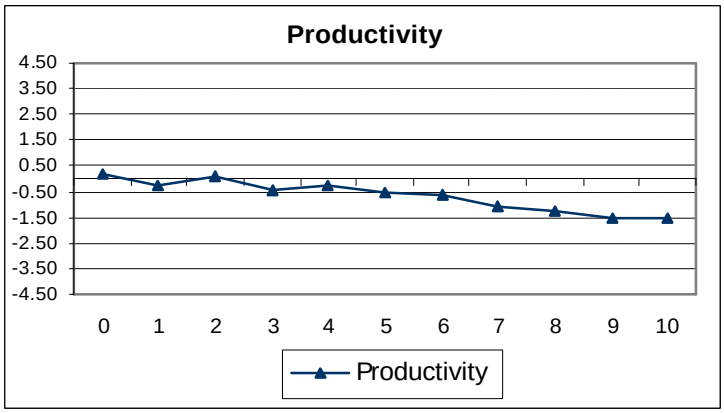
(26) Non-Metal Mineral Products

Response to Unit Cost of Capital Shock

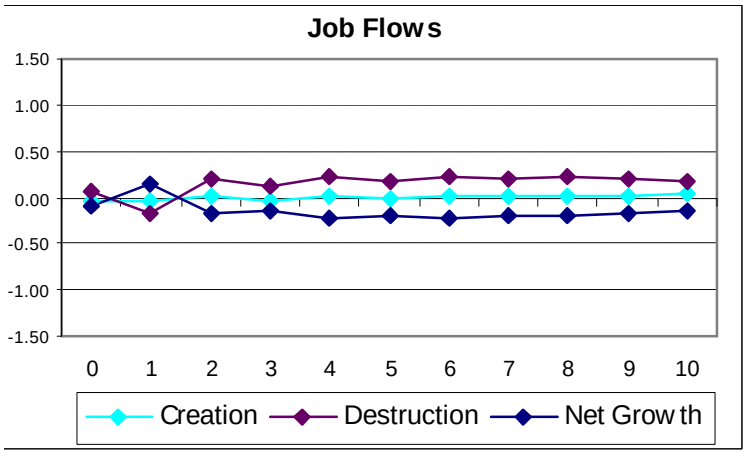


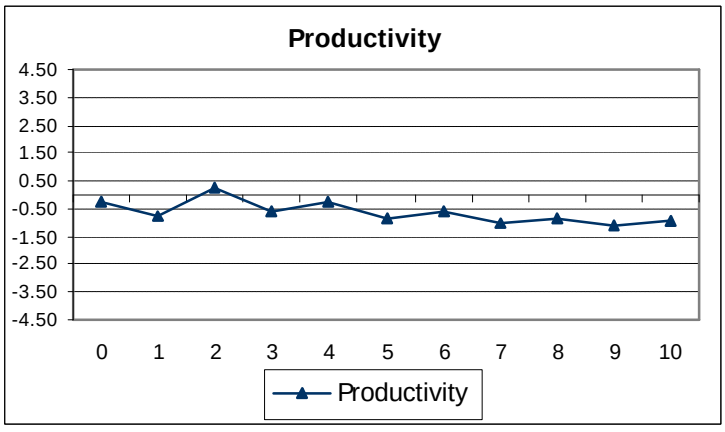
Response to Unit Non-Wage Labor Cost Shock





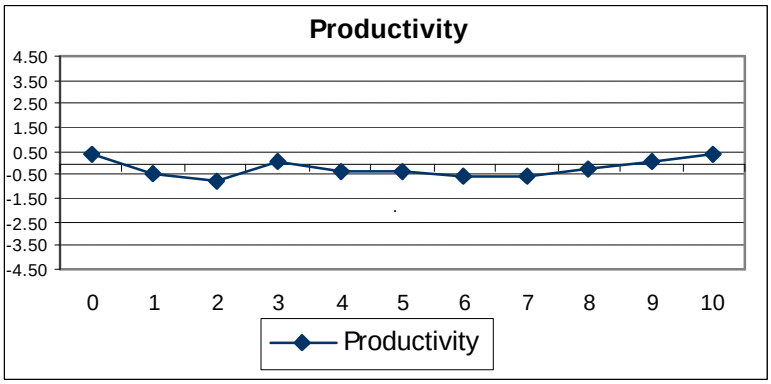
Response to Unit Tariff Shock



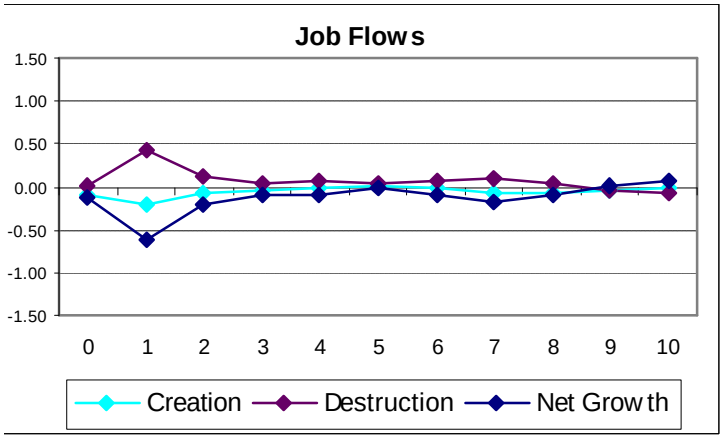


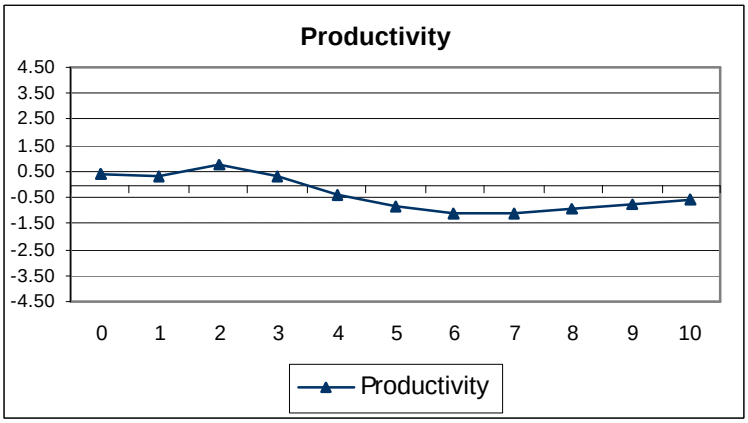
(29) Machinery and Equipment nec

Response to Unit Cost of Capital Shock

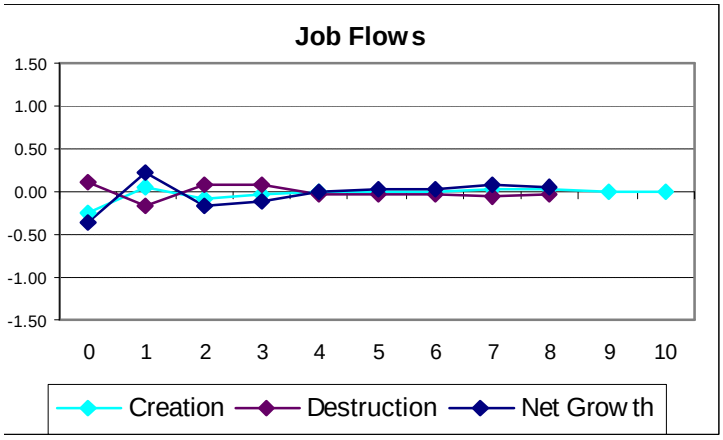


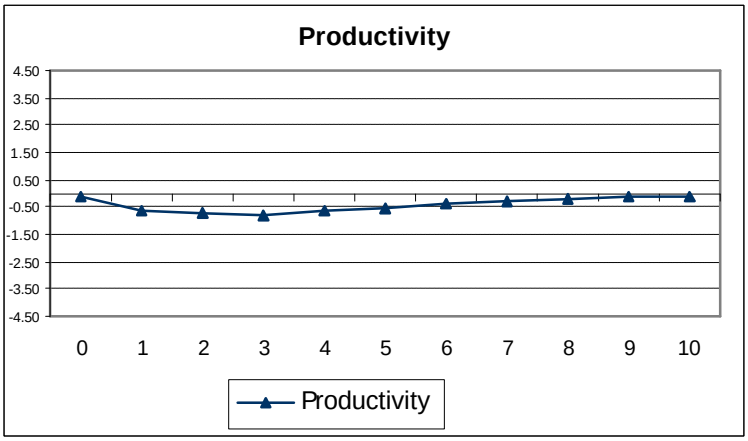
Response to Unit Non-Wage Labor Cost Shock





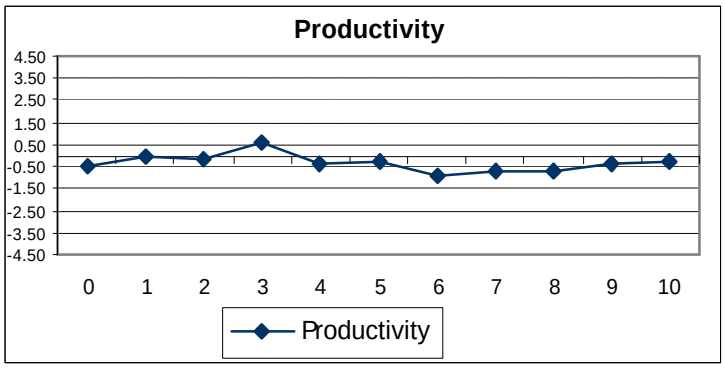
Response to Unit Tariff Shock



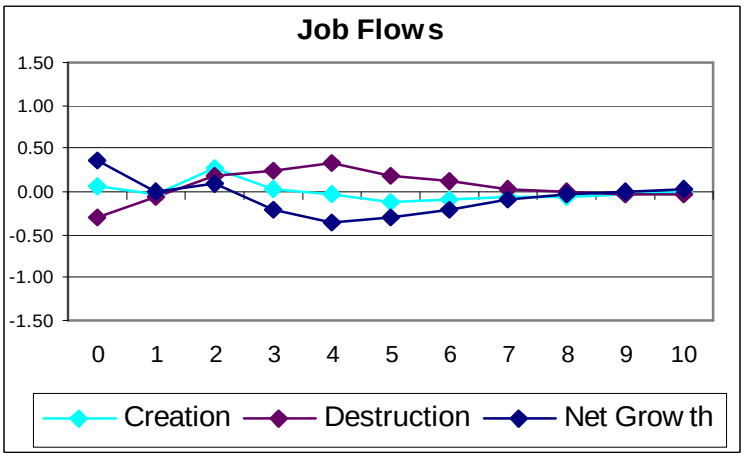


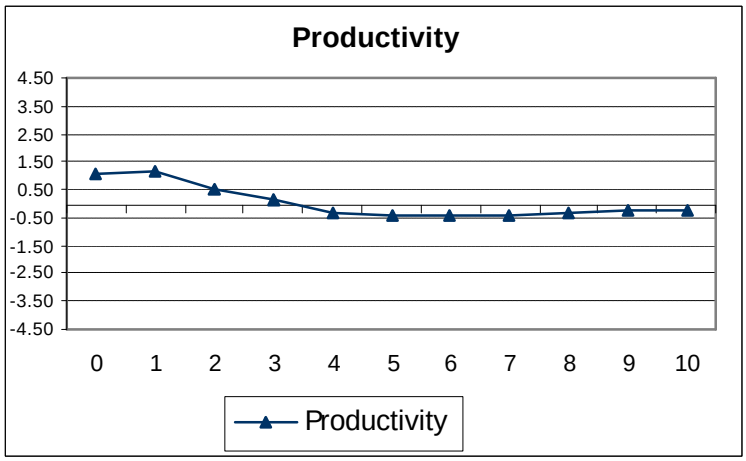
(31) Electrical Machinery and Equipment

Response to Unit Cost of Capital Shock

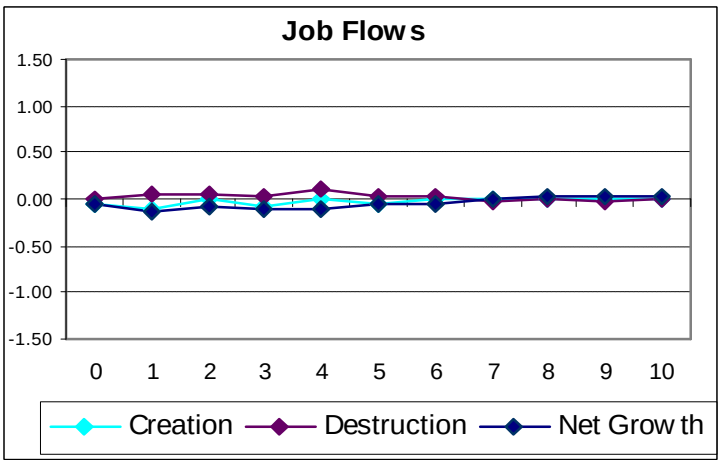


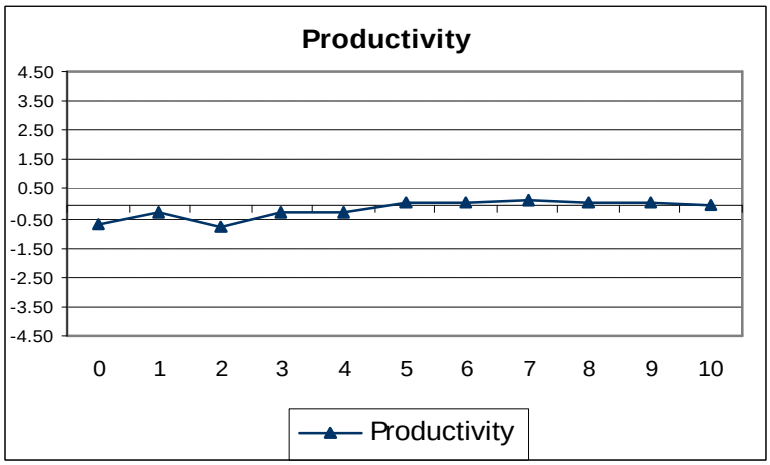
Response to Unit Non-Wage Labor Cost Shock





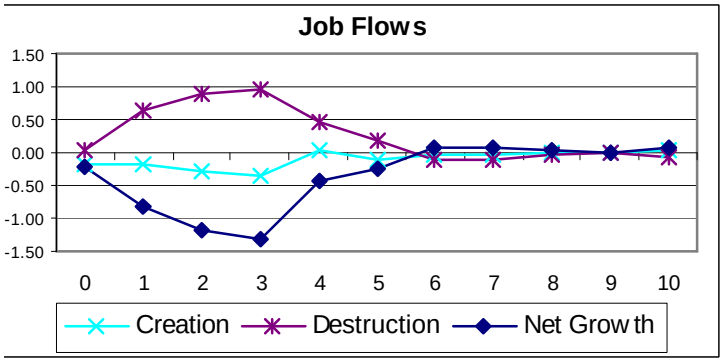
Response to Unit Tariff Shock

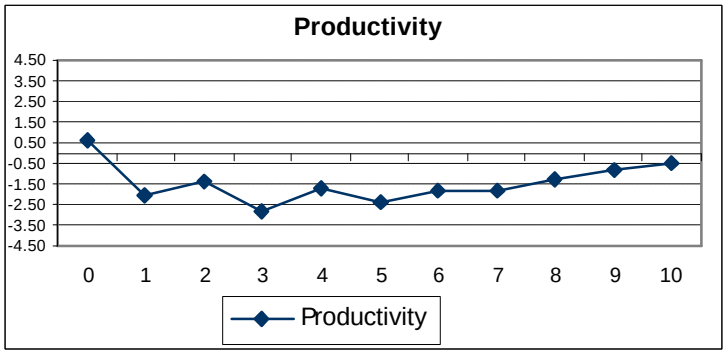




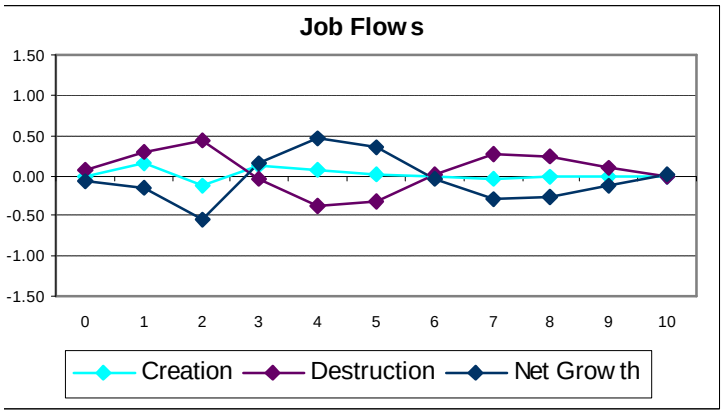
(36) Furniture and Mattresses

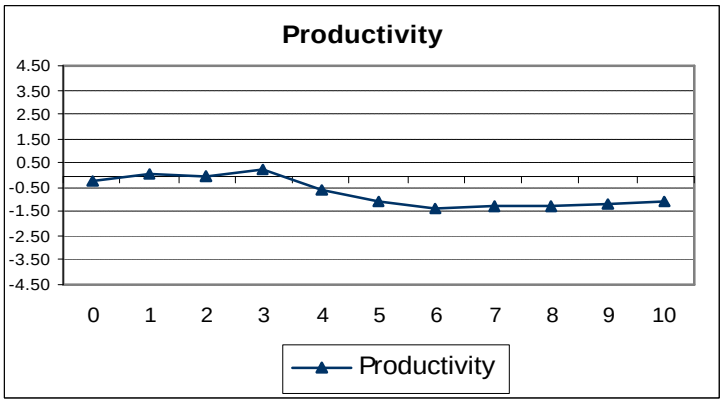
Response to Unit Cost of Capital Shock



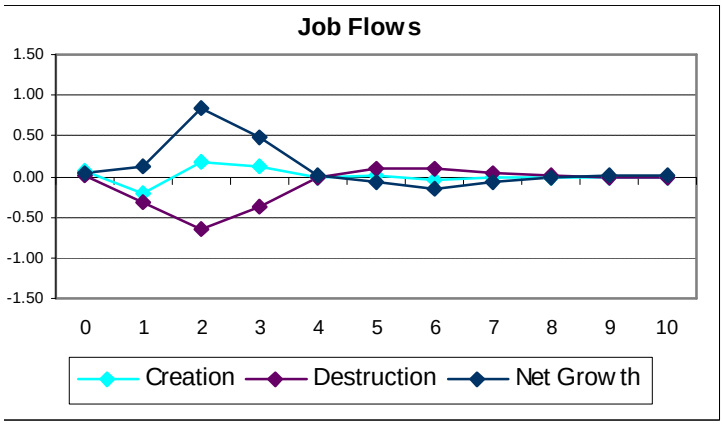


Response to Unit Non-Wage Labor Cost Shock





Response to Unit Tariff Shock



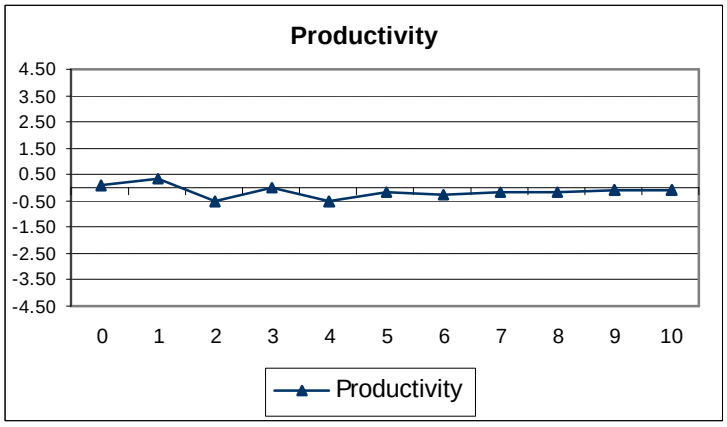
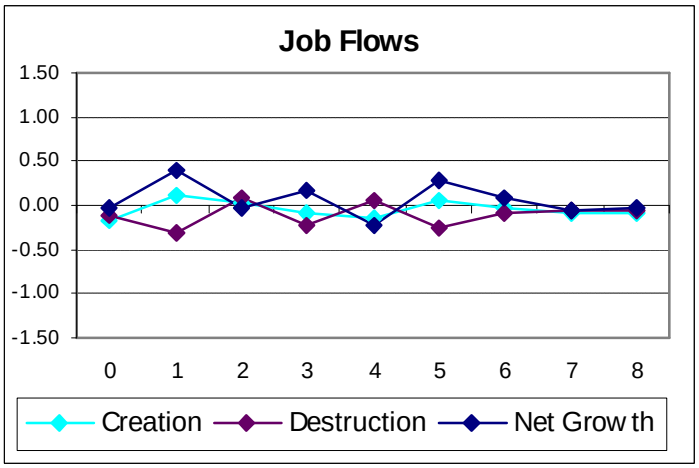
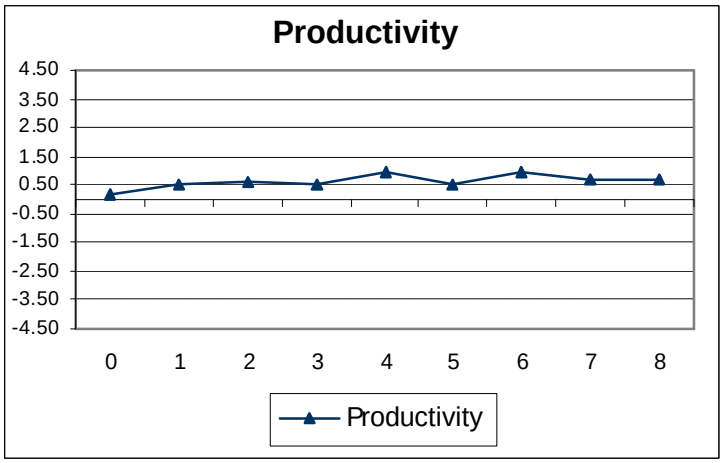


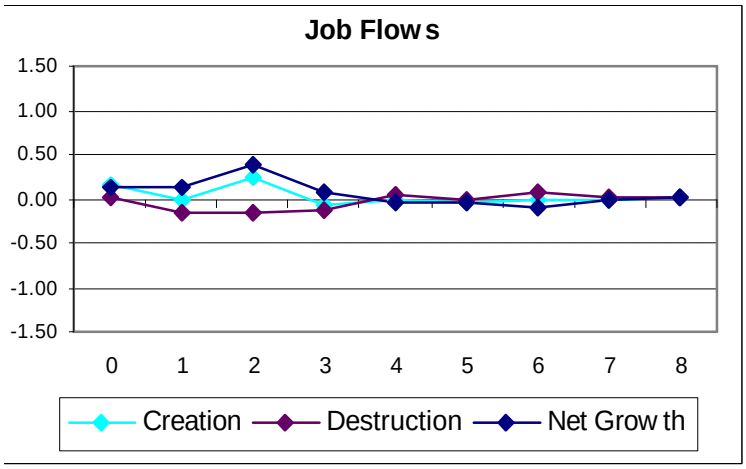
Figure 10: Impulse Response Function to Unit to Tariff Shocks

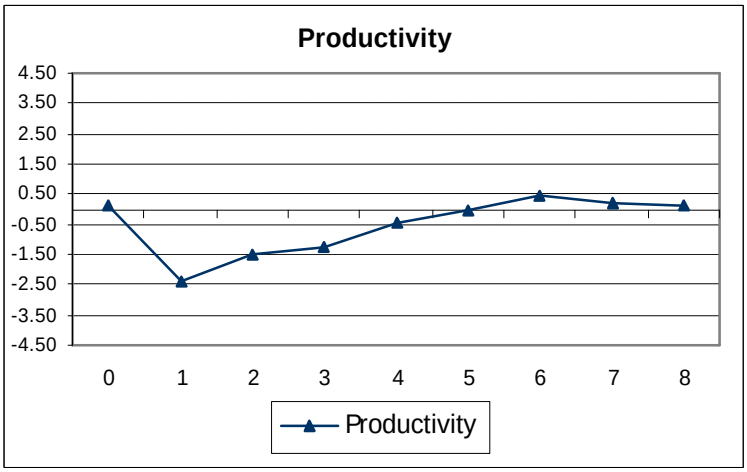
(15) Food and Beverages





(17) Textiles





(18) Apparel

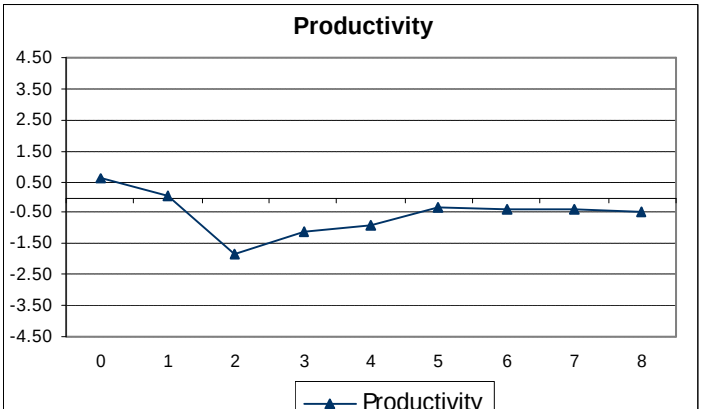
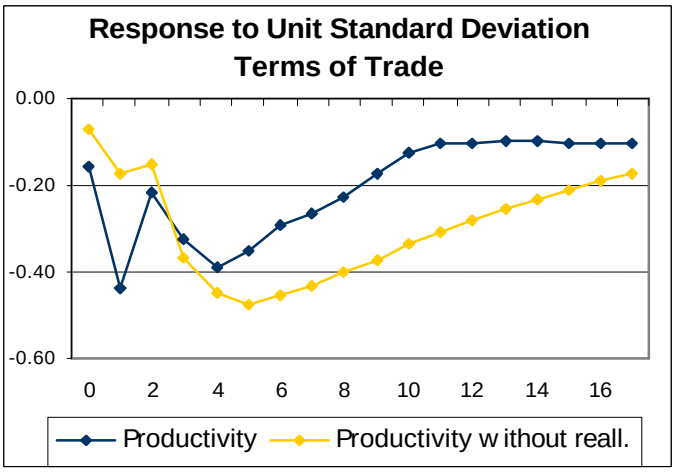
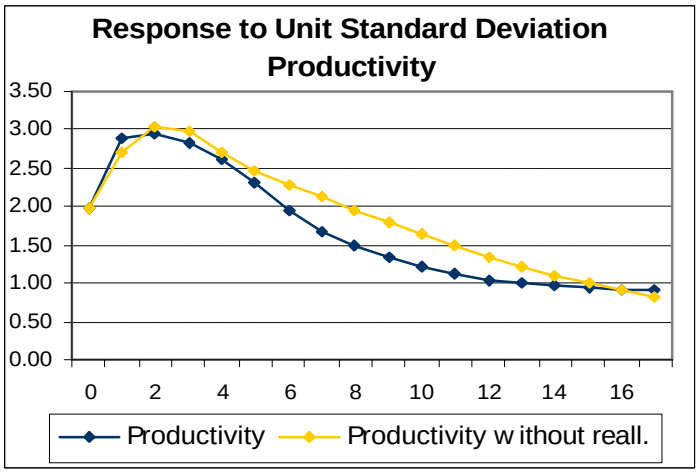
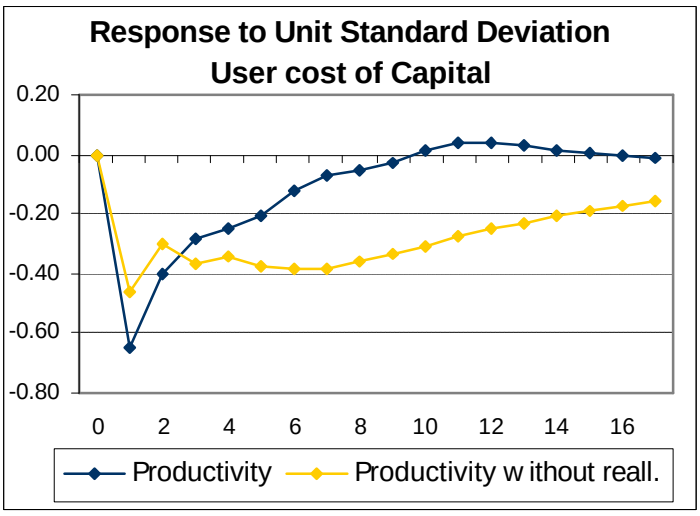
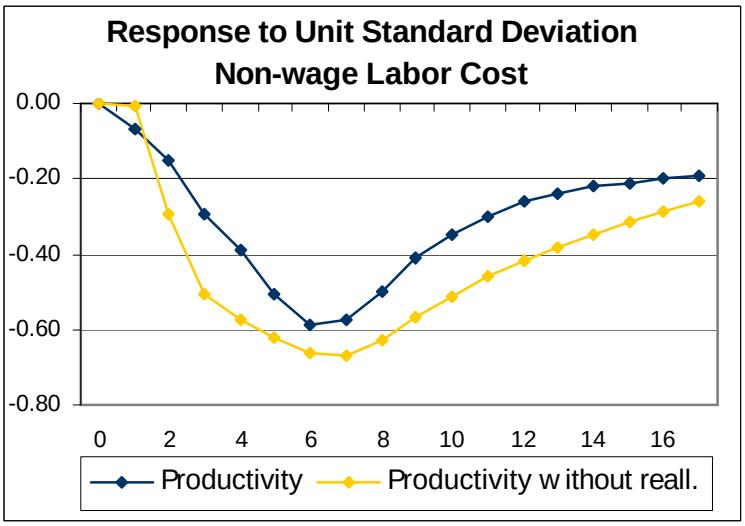


Figure 11: Aggregate effects of Reallocation in Productivity





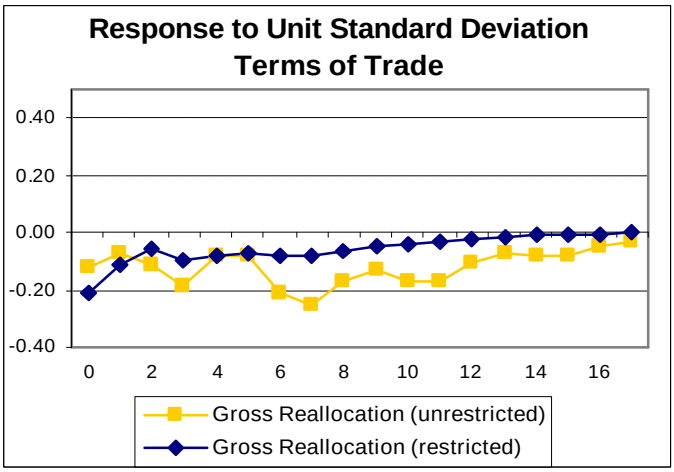


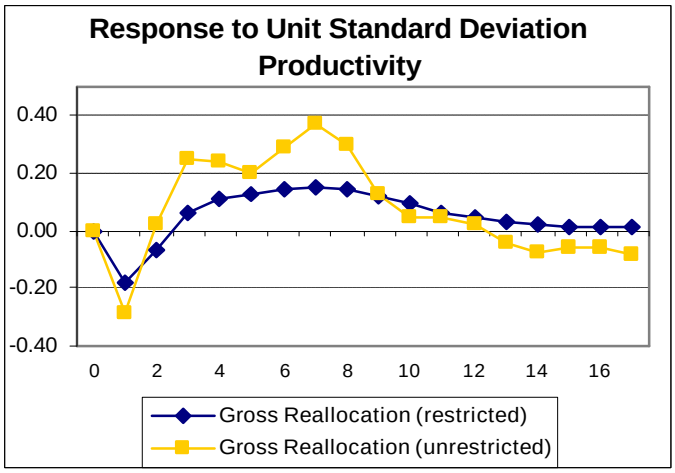


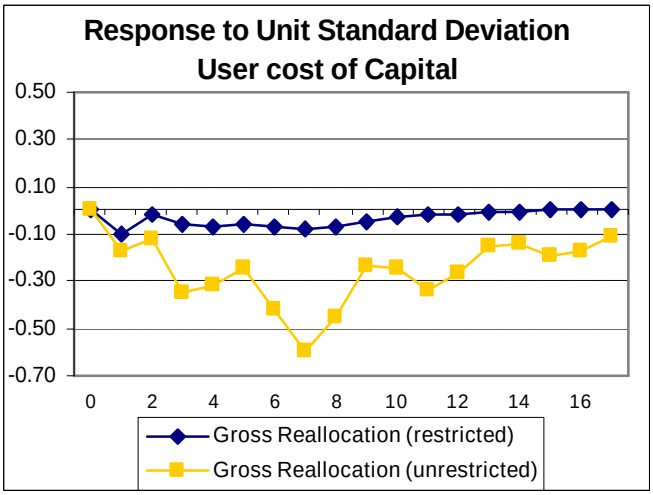
Dark line: productivity response in base line case

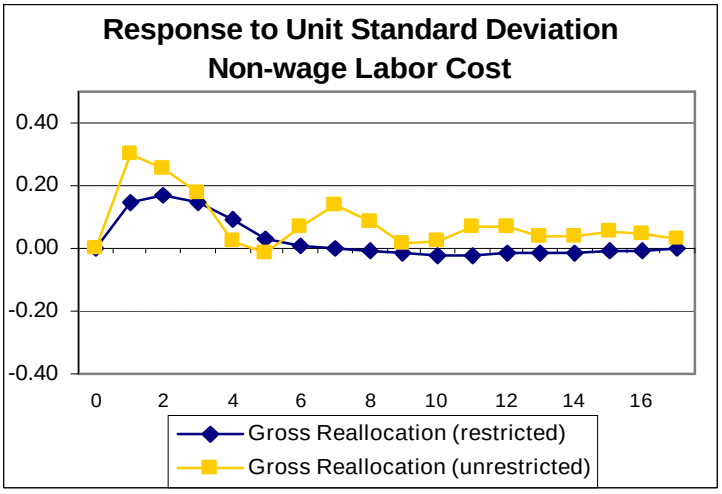
Light line: productivity response when job flows are shut-off

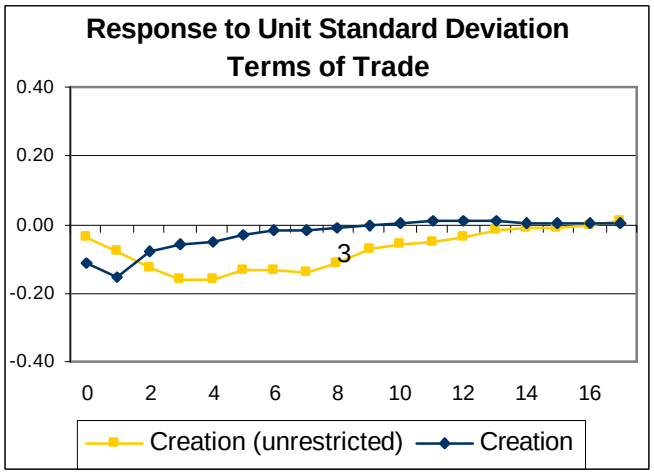
Figure 12: Impulse-Response Functions for Reallocation, restricted (1991-2001) VAR and unrestricted (1993-2001) VAR

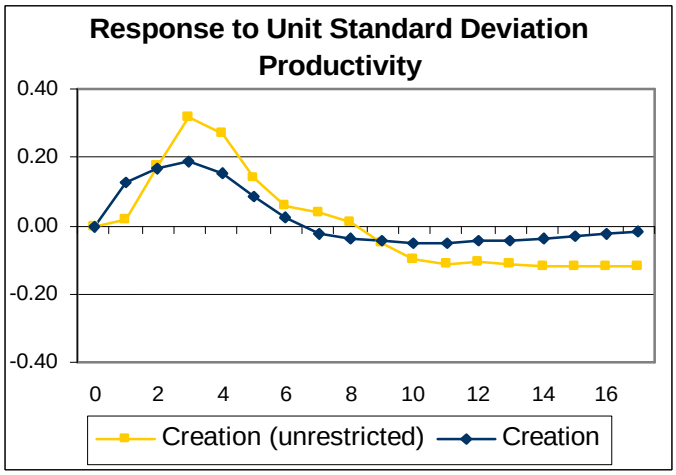


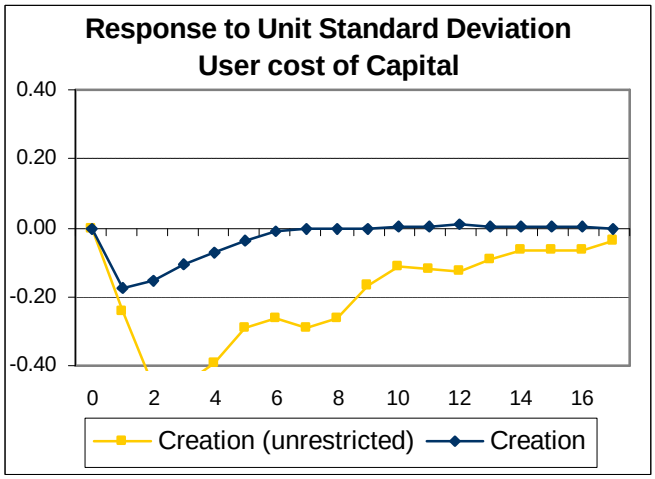


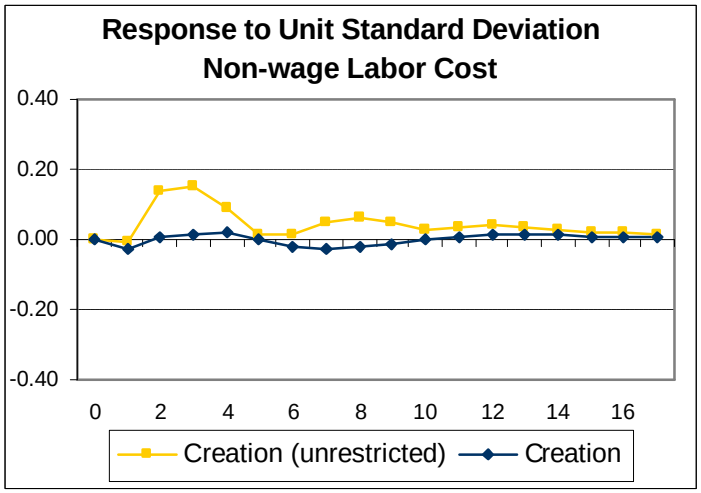


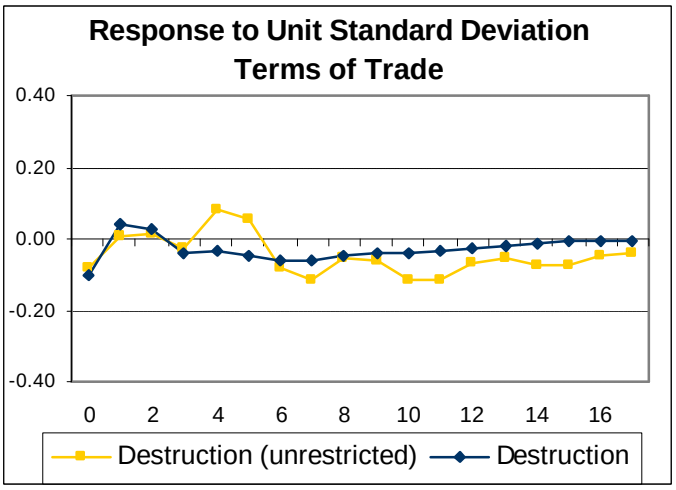


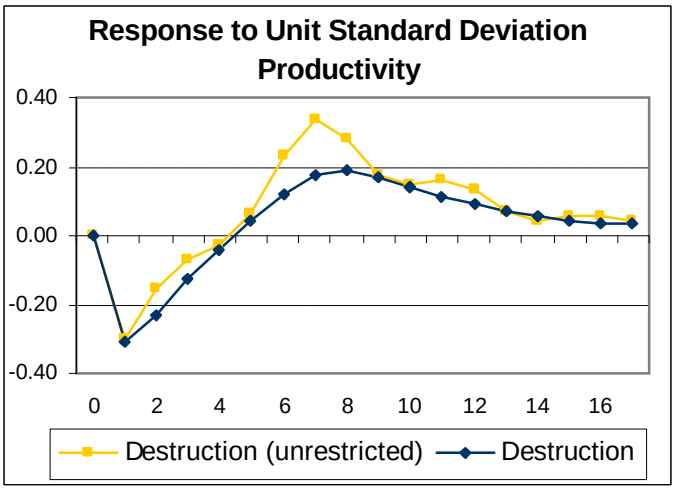

Response to Unit Standard Deviation
Terms of Trade
0.40
0.20
0.00
-0.20
-0.40
0
2
4
6
8
10
12
14
16
Creation (unrestricted)
Creation

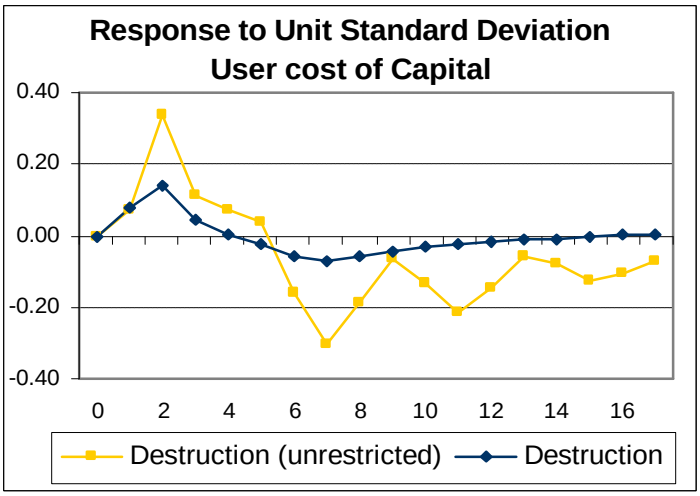

Response to Unit Standard Deviation
Productivity
0.40
0.20
0.00
-0.20
-0.40
0
2
4
6
8
10
12
14
16
Creation (unrestricted)
Creation

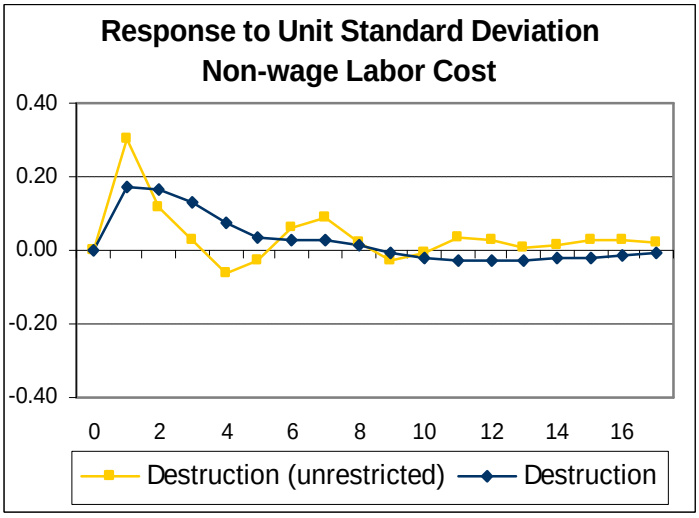

Response to Unit Standard Deviation
User cost of Capital
0.40
0.20
0.00
-0.20
-0.40
0
2
4
6
8
10
12
14
16
Creation (unrestricted)
Creation

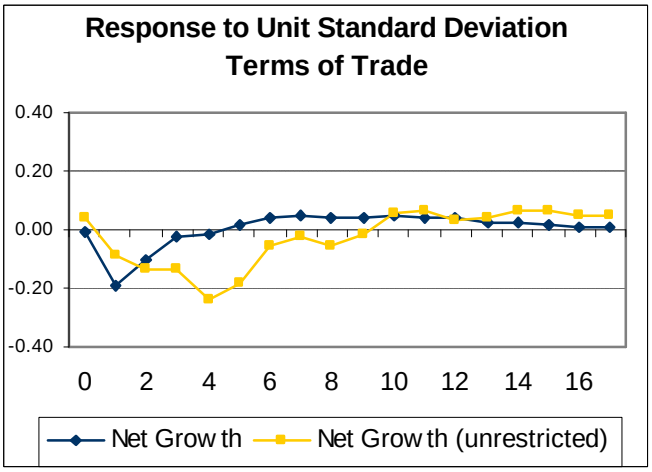

Response to Unit Standard Deviation
Non-wage Labor Cost
0.40
0.20
0.00
-0.20
-0.40
0
2
4
6
8
10
12
14
16
Creation (unrestricted)
Creation

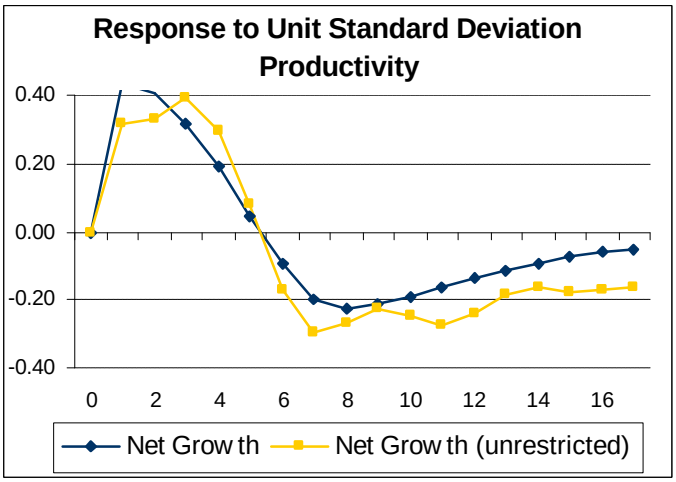

Response to Unit Standard Deviation
Terms of Trade
0.40
0.20
0.00
-0.20
-0.40
0 2 4 6 8 10 12 14 16
Destruction (unrestricted)
Destruction

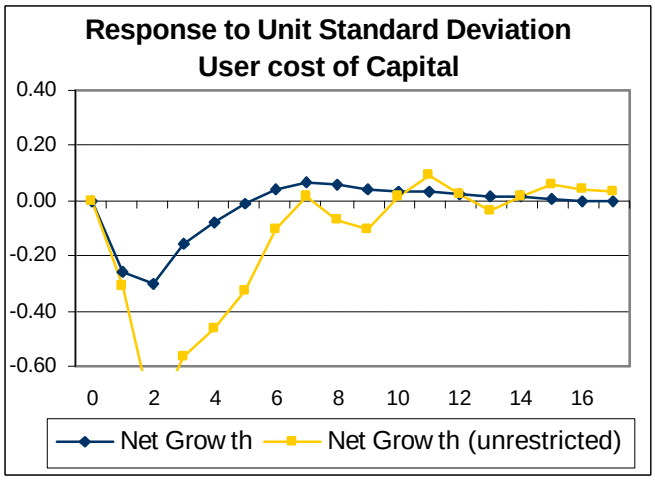

Response to Unit Standard Deviation
Productivity
0.40
0.20
0.00
-0.20
-0.40
0 2 4 6 8 10 12 14 16
Destruction (unrestricted)
Destruction

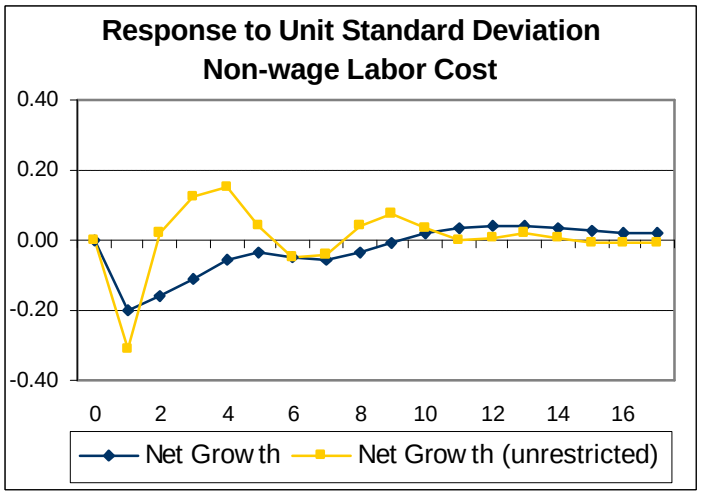

Response to Unit Standard Deviation
User cost of Capital
0.40
0.20
0.00
-0.20
-0.40
0 2 4 6 8 10 12 14 16
Destruction (unrestricted)
Destruction


Response to Unit Standard Deviation
Non-wage Labor Cost
0.40
0.20
0.00
-0.20
-0.40
0 2 4 6 8 10 12 14 16
Destruction (unrestricted)
Destruction


Response to Unit Standard Deviation
Terms of Trade
0.40
0.20
0.00
-0.20
-0.40
0 2 4 6 8 10 12 14 16
Net Grow th
Net Grow th (unrestricted)


Response to Unit Standard Deviation
Productivity
0.40
0.20
0.00
-0.20
-0.40
0 2 4 6 8 10 12 14 16
Net Grow th
Net Grow th (unrestricted)


Response to Unit Standard Deviation
User cost of Capital
0.40
0.20
0.00
-0.20
-0.40
-0.60
0 2 4 6 8 10 12 14 16
Net Grow th
Net Grow th (unrestricted)


Response to Unit Standard Deviation
Non-wage Labor Cost
0.40
0.20
0.00
-0.20
-0.40
0 2 4 6 8 10 12 14 16
Net Grow th
Net Grow th (unrestricted)

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