Market Institutions, Labor Market Dynamics and Productivity in Argentina during the 1990s

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Abstract

This paper explores the effects of policy shocks on the dynamics of manufacturing jobs and productivity in Argentina during the 1990s by applying a "Constrained Panel Data Near Vector Autoregression" analysis to a sample of 20 manufacturing industries. The contribution of job reallocation to productivity is studied by analyzing the impulse-responses of productivity when the responses of job flows are shut-off. We finally compare the behavior of job flows and productivity under different structural reforms, perform tests for structural breaks on the VAR coefficients at times of big reforms and compare the impulse-response functions under different policy regimes. The main findings are that: a) reductions in labor taxes mostly preserve existing jobs rather than favor the creation of new jobs; b) adverse shocks to the cost of capital have negative effects on net employment growth, reallocation and productivity; c) the most frequent effect of bigger sectoral tariffs is to protect obsolete jobs; d) the industry-level responses to the different shocks are quite heterogeneous, mostly because of differences in factor intensity and openness to trade; more open sectors tend to reallocate more e) increased reallocation within the manufacturing sector as a whole contributes positively to productivity; the evidence in favor of a positive contribution of intra-sectoral reallocation to productivity is more mixed; f) the more flexible policy environment after 1995 (because of Mercosur and labor market reforms) favored reallocation, net growth and productivity, while the bigger reliance on banking credit made jobs more vulnerable to adverse financial shocks; g) privatizations provoked large destruction and reallocation in the largest establishments, but made them more resilient to subsequent adverse shocks; h) Mercosur, increased access to credit and more flexible labor markets appear to have favored establishments operating in industries with high export shares.

Keywords	Economic reform, policy shocks, gross job flows, creative destruction, productivity, vector autoregression
JEL Codes	E24, E32, J23

1. INTRODUCTION

This paper seeks to shed light on the effects of economic reforms and policy shocks on the dynamics of manufacturing employment and productivity in Argentina during the 1990s. This decade was landmarked by macroeconomic stabilization, deregulation, privatization, labor market reforms and trade and capital account liberalization. Additionally, the economy was subject to frequent and significant policy shocks, especially in the area of taxation. This period featured negative growth of manufacturing employment (except for some quarters during 1997-1998), leading to a large cumulative reduction. Gross job creation, destruction and reallocation displayed significant fluctuations, suggesting that the labor market was highly responsive to price and policy shocks and to structural reforms during the period (see Table 1 and Figure 1). At the same time, labor productivity grew at a large average rate.

A key finding in the literature on the determinants of productivity growth in developed countries is that much or most of this 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). Negative profitability shocks (such as rises in input costs or in production taxes) are expected to stimulate this reallocation. The timing, size and efficiency of job reallocation and its contribution to productivity growth is affected by policies and institutions (like firing costs and tariff protection) that isolate existing jobs from profitability shocks and/or increase the specificity of investment (like excessive workers' bargaining power). Caballero and Hammour (1996, 2000) have suggested that the prevalence of these features in developing countries should lead to

sub-optimal reallocations and to technological sclerosis. Further effects of economic reforms and policy shocks on reallocation and productivity may work through the incentives and abilities to expand or contract sectoral production, to introduce technological innovations, and to change the scale of operations and the choice of production techniques.

With this motivation in mind, the paper concentrates on analyzing the effects on manufacturing job flows and productivity of shocks to non-wage labor costs, to sectoral tariffs and to the user cost of capital, and on appraising the effect of structural reforms as a whole on job dynamics and productivity in Argentina. We are particularly interested in shedding light on the following questions:

- Do reductions in payroll taxes promote bigger net job growth?
- Do commercial policies protect obsolete jobs?
- How important are financial shocks for job flows and productivity?
- Which institutions discourage reallocation more?
- Does bigger reallocation lead to bigger productivity? Do reforms that make labor and goods markets more flexible contribute to bigger reallocation and productivity?

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 policy and cyclical shocks to profitability. To appraise the determinants of the inter-industry pattern of responses to the different shocks, the cumulative impulse responses of job flows

and productivity are regressed on vectors of sectoral characteristics that labor intensity, sectoral access to credit, workers 'strength and the trade exposure and orientation.

In order to appraise the contribution of reallocation to productivity, 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 that obtained in the baseline case.

To check whether structural reforms caused changes in the natures of job flows and productivity and in their responses to the different shocks we compare their behavior under different policy regimes. We then test for structural breaks on the VAR coefficients at times of major reforms and compare the impulse-response functions for the resulting sub-periods.

This paper is novel in that it empirically assays the effects of shocks and reforms on *both* job flows and productivity, trying to unveil the links between both.

Section 2 discusses the reforms that occurred between 1990 and 2001. The basic facts for the manufacturing labor market are presented in Section 3. The econometric analysis of the effects of policy shocks on job and productivity dynamics is the subject of Section 4. The contribution of reallocation to productivity is studied in Section 5. The impact of reforms on job flows and productivity is analyzed in Section 6. Section 7 concludes.

2. ECONOMIC REFORMS AND POLICY SHOCKS DURING THE 1990s

The 1990-2001 period witnessed the introduction of continous and significant structural reforms. Two different sub-periods can be distinguished: 1990-1994 and 1995-2001.

The most salient policy reforms and macroeconomic developments of 1991-1994 were: 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 public utilities, banks and transportation, and manufacturing activities like oil refining, steel, petrochemicals and shipyards, c) the MFN trade liberalization of April 1991, when average tariffs were halved,[1] 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,[2] f) relatively small reliance on banking credit.[3]

The 1995-01 period was characterized 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,[4] 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

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

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

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

[4] All capital inflows represented 7.1% of GDP on average during 1995-2001, 8.7% during 1996-1997 and 7.2% during 1998-2001.

steadily until the end of 2000,[5] 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.[6]

The reforms introduced during the decade worked in the direction of increased competition and regional market access, enhanced access to credit and to imported intermediate and capital goods, and a more market-friendly policy environment. 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 took place, making the Argentine manufacturing sector more vulnerable to macroeconomic shocks in Brazil.[7] A final salient feature is that during the first sub-period a large share of manufacturing job flows must have been driven by the privatization process.

3. AGGREGATE AND SECTORAL JOB FLOWS AND PRODUCTIVITY

Data on sectoral job flows and productivity for the manufacturing sector are from the Monthly Industrial Survey (MIS) carried out by INDEC.[8] The reference universe consists of firms employing more than 10 staff and covers all the activities in the manufacturing sector. The data provided by INDEC covers the period 1990-2001. The frequency of the data is

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

[6] 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.

[7] 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.

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

quarterly, with 48 periods available. The definition of job flows (creation, destruction, net growth and reallocation) and of productivity is presented in Annex I.

The aggregate manufacturing data for the 1990-2001 period show a prevalence of job destruction over rather modest rates of job creation (see Table 1). As a result, the net growth of employment is negative in most 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 period.[9] Reallocation is relatively low.[10] Figure 1 shows that aggregate gross and net job flows displayed significant frequent fluctuations during the period.

The behavior of gross and net job flows by industry (defined at two digit ISIC rev. 3) is similar to the aggregate, with low rates of creation and moderate rates of destruction and reallocation, albeit with an important degree of heterogeneity regarding the sizes of job flows (see Table 2).[11] This suggests that differences in characteristics by industry (technology, access to credit, etc.) affect the responses to shocks and reforms.

Labor productivity grew at a 6.5% annual rate for the manufacturing sector during 1990-2001 (see Figure 2). This fast productivity growth could be reflecting a combination of adoption of labor-saving technologies, intrasectoral reallocation and structural change that favors capital intensive activities. This positive trend was disrupted in the periods of

[9] 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 data 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.

[10] 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.

[11] 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 most negative net growth (-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%.

contraction in manufacturing output (some quarters of 1995, 1999 and 2001). This behavior of productivity is common to all sectors and classifications, but with a wide dispersion in productivity growth rates at the industry level.[12] The establishments in industries with high exposure to trade, especially the ones facing bigger import penetration, experienced the highest productivity growth in 1991 (14.6%), 1992 (19.1%) and in 1996 (25%).[13]

4. EFFECTS OF POLICY SHOCKS ON JOB FLOWS AND PRODUCTIVITY

This section examines the effects on manufacturing job flows and productivity of two types of policy shocks, changes in non-wage labor costs (NWLC) and sectoral tariffs, together with shocks to the user shock of capital that are partly driven by domestic policy changes.

We will analyze these effects through the estimation of a constrained near-panel structural VAR for gross job flows and productivity, the aforementioned variables and the terms of trade, following the recent work by Davis and Haltiwanger (2001).[14] We look at the effects on job flows and productivity both at the aggregate manufacturing level and at the 2-digit industry level, to appraise whether different sectors respond differently to shocks and, if so, which sectoral characteristics make their responses differ.[15]

The precise definition of the policy variables is shown in Annex I. Following Mondino and Montoya (1998), our measure of NWLC is defined as the sum of labor taxes and expected

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[12] 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).

[13] 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.

[14] The inclusion of the terms of trade is justified because of its role as a key determinant of cyclical fluctuations in Argentina. Table X shows that this variable had a negative correlation with job destruction and a positive one with productivity.

[15] Additionally, we are concerned with ascertaining whether the changes in intrasectoral reallocation in response to policy shocks have led to increased or decreased productivity within in each industry, i.e., if creative destruction is productivity enhancing.

severance payments, which captures the negative profitability component of shocks to this variable that is factored in in the creation and destruction decisions of firms.[16] Our trade policy measures are sectoral (at the 2-digit level) *effective* nominal import tariffs relative to the average. Following the onset of Mercosur in 1995, we use trade-weighted averages of intra-zone tariffs (zero in most cases) and Mercosur's common external tariffs. 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 time t. δ is the depreciation rate.

Fluctuations in changes in NWLC were very significant between 1993 and 1997 (see Figure 3).[17] Declines in NWLC 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. Table 3 shows NWLC to have a big positive correlation with productivity and low correlation, albeit of a expected sign, with job creation and destruction.

Table 4 shows that the decade was landmarked by continuous, and at times very significant, changes in import tariffs that altered both their average levels and their structure. Figure 4 shows the evolution of the degree of openness, which appears to have been highly sensitive to trade liberalization. This figure shows that sharp tariff reductions in II.91 (on a MFN basis) and in I.95 (within the Mercosur) preceded important surges in destruction.

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[16] 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. 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.

[17] NWLC 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). NWLC 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.

Figure 5 shows that the user cost of capital was subject to several significant shocks during the sample period. Peaks in the cost of capital usually preceded significant drops in net employment growth. Table 3 shows that this variable had a positive correlation with job destruction and productivity and a positive one with job creation. The user cost of capital depends on the real interest rate, which in turn depended on a variety of factors such as foreign interest rates, capital inflows, and domestic macroeconomic policies, among others. These rates were also a function of changes in domestic financial regulations such as minimum reserve requirements.[18] As such, innovations to this cost may reflect not only autonomous monetary or financial policy shocks but also changes in foreign interest rates, for instance.[19]

While there are other significant policy shocks that took place during this period (tax rate changes and deregulations, among others), we concentrate on those that are more closely associated to key reforms: labor market flexibilization, trade liberalization, regional integration, capital account liberalization, the Currency Board and changes in banking regulation.

4.1. Expected effects of policy and financial shocks

We are concerned with two features of these shocks. First, the signs and sizes of their effects on creation, destruction, net job growth, reallocation and productivity. Second, whether they are allocative (affect mostly intrasectoral reallocation) or aggregate (lead to sectoral shifts) in nature, which has different implications in terms of productivity and adjustment costs.

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[18] The cost of capital additionally depended on the price of imported capital goods, which is affected by trade liberalization and by exchange rate fluctuations in non-U.S. trading partners.

[19] The user cost of capital declined sharply during 1991-1992 as a result of the credible introduction of the Currency Board which, together with sizable capital inflows, significantly reduced interest rates. The price of capital goods fell significantly as a result of the exchange rate stabilization and of trade liberalization. In 1993 there was a credibility crisis that led to a run against the peso that pushed interest rates up. The second peak in the cost of capital was caused by the Tequila crisis. The post-Tequila stabilization led to renewed capital inflows that, along with non-tradable inflation, pushed real interest rates down. During 1998-2001, the combination of capital outflows, recession and the Brazilian devaluation led to deflation and mounting interest rates. Additionally, the growing doubts about Argentina§ fiscal solvency led to a rising country-risk premium and to vicious circle of high interest rates-low competitiveness-recession-high country risk and so on.

The aggregate channels through which a shock may affect manufacturing job flows include: effects on potential output; changes in relative prices and/or production costs of the manufacturing sector vis-à-vis the rest of the economy, and among industries. Aggregate shocks thus those that make creation and destruction move in opposite directions.

A shock has allocative effects when it introduces a mismatch between the observed and the desired distributions of labor within an industry, making creation and destruction move together. Negative profitability shocks that lead to the scrapping of the most backward production units, which reduces the costs of search for new jobs, have this effect.

Disturbances to these policy and financial variables would act as profitability shocks with potential allocative effects. Additionally, changes in severance payments and in sectoral tariffs would alter the insulation of obsolete jobs to negative profitability shocks. These shocks would operate through aggregate channels as well: through their effects on the choice of production techniques and in relative costs of production in the cases of the cost of capital and NWLC[20]; through the impact on potential output in the case of the cost of capital; and through changes in sectoral relative prices in the case of tariffs.

Policy and cyclical shocks will have both direct effects, through choices of production techniques and imports of intermediate inputs with embedded technological change, 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.[21]

4.2. Estimating the dynamic effects of policy shocks

[20] According to the 1997 Input-Output tables, manufacturing is 2.5 times more capital intensive than the rest of the economy.

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

The analysis of the sign, size and timing of the effects of the policy 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 a ten-variable linear stochastic system for each 2-digit industry under analysis.[22]

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, industry j's tariff, industry j's creation and industry j's destruction and industry j's productivity. It is assumed that Y_t has a linear moving average representation in terms of innovations to structural disturbances:

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

The elements of ε_t correspond to time t-values of innovations to the variables included in Y_t. We cannot estimate (1) 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. We can then estimate the contribution to the forecast-error variance of each innovation to the structural disturbances. We can also recover B(L) and compute the impulse-response functions to the different innovations to structural disturbances. Details on the estimations are provided in Annex II.

The identifying assumptions made impose a bloc recursive structure with 8 blocs: one terms of trade variable; total manufacturing job creation and destruction; aggregate labor

[22] 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.

productivity; the aggregate user cost of capital; the aggregate non-wage labor cost; sectoral tariff; sectoral job creation and destruction; sectoral labor productivity.

Under this ordering, structural innovations in each bloc have a contemporaneous effect on the forecast-error variances of all the subsequent blocs in the system, and no contemporaneous effect on the preceding blocs. Structural innovations are taken to be orthogonal with each other.

The choice of causal ordering reflects our priors regarding the contemporaneous effects of the different variables on the rest. In this vein, the bloc for aggregate labor productivity is placed after the blocs for the terms of trade and for aggregate job creation and destruction to capture the possibility that it varies cyclically due to adjustment costs and/or variations in factor utilization rates. This causal ordering also reflects our priors regarding the effects of reallocation on productivity. It makes sense to place the user cost of capital next as it largely depends on unanticipated aggregate shocks (recession, fiscal deficit, etc.) that affect capital inflows and the country risk premium.[23] The autonomous component of the shocks to this variable reflects either foreign developments or changes in domestic financial policies that are not contemporaneously affected by other aggregate shocks. Aggregate NWLC are placed next because they are contemporaneously affected by the preceding aggregate disturbances through their impact on expected firing costs.[24] The structural shocks to NWLC thus represent the innovation to autonomous decisions regarding labor taxes and regulations.[25] We place the

[23] Under the Currency Board Argentina lacked an active monetary policy. Hence the endogeneity of interest rates did not arise from feedback rules of policymakers..

[24] As for the possible existance of feedback rules from aggregate shocks to labor taxes, we assume that they operate with a lag.

[25] 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

sectoral tariff bloc next to reflect the fact that the trade-weighted tariffs are affected by the aggregate shocks that alter Argentina's sources of imports.[26] One key innovation in our approach is the inclusion of both job flows and labor productivity variables in our sectoral near-VAR systems.

Variance decomposition analysis

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. The results suggest that policy and financial shocks taken together play a non-trivial role in accounting for the variability of gross job flows, especially in the short run, explaining 18% of the four-step ahead variance of job creation and 17.4% in the case of destruction. If we concentrate on the variance of sectoral productivity, we can see that the policy and financial shocks also play a non-negligible role, especially in the short run.

Impulse-Response analysis

The dynamic response to user cost of capital shocks

Figure 6 shows that aggregate destruction rises and aggregate creation 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.[27] Job reallocation falls throughout. 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. The

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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.

[26] The determination of tariff rates 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 they are subject to political agreement both within the country and within the Mercosur.

response pattern fits the profile of an aggregate disturbance in the short-run, with a negative response of employment.[28] Figure 6 also shows that the response of aggregate labor productivity to this shock is always negative, but significantly different from zero only up to the second quarter after the shock.[29]

The sectoral creation and destruction responses to the cost of capital for all 20 detailed sectors were also examined.[30] The results for all sectors, which are summarized in Table 6, show that net employment growth goes down in 95% of the industries in the short run, which together represent 96.4% of manufacturing employment. The shock has opposite effects on creation and on destruction for 60% of the sectors in the short and long runs. This result suggests that this shock affects sectoral gross job flows through a mixture of aggregate and allocative channels, although the former are more prevalent.

Creation falls in 95% of the industries 2 and 4 years after the shock, while destruction rises in 65% of the cases in the short and long runs. Additionally, reallocation declines in 60% of the industries (that represent 77.8% of employment) in the short and long-runs. The magnitude of the creation response exceeds the magnitude of destruction for 55% of the industries at all times. The typical effect is thus to depress job creation and to rise destruction, especially in the short run, with a negative impact on reallocation and net growth.

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[27] The cumulative response of employment growth is -0.89% after 8 quarters and –0.45% after 16 quarters.

[28] 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%.

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

[30] The standard errors for the industry-level impulse responses were estimated via Montercarlo simulations. The non-zero impulse responses were assumed to be those that are significantly different from zero at a 10% level of significance.

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

Labor productivity declines in 70% of all industries (which represent 55.7% of total employment) in the short and long runs in response to this shock. One possible explanation would be that the more prevalent depressed reallocation lowers productivity.[31]

The dynamic response to non-wage labor cost shocks

A positive shock to NWLC leads to a large rise in aggregate destruction and to no changes in creation at its aftermath. The increase in destruction lasts until the sixth quarter, converging to zero thereafter (see Figure 6).[32] The peak response of net employment growth occurs in the first quarter after the shock, and it is fully generated by the rise in destruction.[33] Job reallocation rises steadily until the sixth quarter after the shock and begin to slowly decline since then. This pattern of response conforms to an aggregate disturbance.[34] The response of aggregate productivity is negative, albeit not significantly different from zero, at all times.

The sectoral creation and destruction responses were also examined. The results for all sectors, which are summarized in Table 6, show that net employment growth goes down for 80% of the industries (which represent 85.9% of employment) in the short run and long runs.

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[31] Other possibilities would be that adverse shocks to the cost of capital slow down the incorporation of advanced new capital goods and/or that they lead to the use of more labor intensive production techniques.

[32] The cumulative response of destruction amounts 0.57% five quarters after the shock and to 0.62% two years after the shock.

[33] The magnitude of this peak response is about half as large as the one generated by a shock to the user cost of capital. The cumulative response of employment growth is -0.65% two years after the shock, and –0.52% two years after that.

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

The shock moves creation and destruction in the opposite direction in 60% of the sectors at all times, suggesting that these shocks operate on sectoral gross job flows both through aggregate and allocative channels, although the former prevail.

The absolute values of the responses of destruction exceed those of creation in 65% of the industries in the short-run (70% in the long-run). Destruction rises in 85% of the cases at all times. Creation goes up in 45% of the industries at all times, and declines in the rest. Gross job reallocation goes up in 75% of the industries (that represent 72.9% of employment) in the short-run (80% in the long-run). The typical cumulative effect of a NWLC shock is thus to raise job destruction and job reallocation, with a mixed effect on creation. These responses suggest that this shock acts mostly as a negative profitability shock that raises destruction. The mixed response of creation could arise from the offsetting effects of the shock on search costs and on the incentives to substitute away from labor entailed by the bigger NWLC.

A positive shock to NWLC is estimated to increase labor productivity in only 40% of the industries (that account for 31.5% of employment) at all times, replicating at the sectoral level the aggregate finding that this shock does not appear to lead to the destruction of the least productive jobs.

The dynamic response to trade reforms

The impulse responses of sectoral job flows and productivity to changes in sectoral tariffs, which are summarized in Table 6, show that net employment growth goes up in only 45% of the industries (that represent 57.2% of employment) in the short run, and in 40% in the long run. The shock has opposite effects on creation and on destruction in 50% of the sectors at all times, suggesting that tariff shocks affect gross job flows both through aggregate

and allocative channels.

Creation rises in only 30% of the industries at all times, while destruction falls in 60% of the cases in the short and long runs. Additionally, reallocation decreases in 70% of the industries (that represent 75.6% of employment) at all times. Finally, the magnitude of the changes in destruction exceed those of creation in 75% of the cases in the short run, and in 70% in the long run.

These results suggest that the leading effects of sectoral tariff hikes are to depress destruction and reallocation. Tariffs seem to act mostly as permanent production incentives that protect existing jobs and sclerosize the labor market. We find no evidence in favor of a relative price effect that raises creation by shifting resources away from other industries.

A positive tariff shock lowers productivity in 60% of the industries (that account for 49.% of employment) 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. Tariffs appear to be protecting the most obsolete jobs.

4.3. The importance of sectoral characteristics

This section seeks to disentangle the relative contribution of sectoral characteristics to the industry-level responses of job flows and productivity to each shock. Following Davis and Haltiwanger (2001), we run a set of linear regressions of the cumulative responses of net employment, gross job reallocation and productivity on industry-level measures of labor intensity, access to credit, workers' strength, and measures of exposure to trade and of trade

orientation.[35] The cumulative responses are obtained from the estimation of the near-VAR systems for 20 2-digit manufacturing industries performed in the previous section. Table 7 summarizes the estimated impact of the characteristics in explaining industry differences in the cumulative responses to different shocks, which we discuss next.

LABOR-INTENSITY: More labor intensive industries are less vulnerable to adverse shocks to the user cost of capital (reduce destruction and net growth less, decline reallocation and productivity more), but more sensitive to rises in NWLC (net growth falls more, creation and reallocation rise less and productivity falls less). The bigger the labor intensity, the lower (bigger) the negative profitability shock associated to a rise in the cost of capital (NWLC).

ACCESS TO CREDIT: This characteristic does not appear to play a big role except that, as it would be expected, industries that rely more on banking credit display (weakly) bigger declines in net growth in response to a rise in the user cost of capital.

WORKERS'STRENGTH: Inter-industry differences in our measure of workers'bargaining power do not appear to play a significant role in explaining the heterogeneity of responses to the different shocks, i.e., they do not appear as disruptive for creative destruction.

OPENNESS TO TRADE: Industries that are more open to trade appear to operate in a more flexible environment. When hit with a rise in NWLC, these industries display smaller declines in net employment growth and productivity, together with bigger rises in creation and reallocation. Additionally, tariff hikes appear to introduce a bigger degree of sclerosis in the

[35] The estimates of sectoral labor intensity are obtained from the 1997 Input-Output Tables. 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 Annex I.. Degree of openness is defined as industrial exports plus imports relative to industrial GDP. Sectoral import penetration is imports relative to sectoral output plus imports). Sectoral trade balance is normalized by 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.

more open industries by inducing bigger declines in reallocation and lower rises in creation and net growth. These patterns of responses are shared by the industries with bigger export shares and bigger import penetration.

To the extent that differences in sectoral levels of protection may make some industries more closed to trade than others, protectionism appears as an important barrier to reallocation.

5. REALLOCATION AND PRODUCTIVITY

In order to analyze the contribution of reallocation to productivity, we estimate the impact of the policy and financial shocks on productivity when the responses of job flows are shut-off.[36] The resulting impulse-response functions of productivity are then compared to the ones obtained for the unrestricted system. It should be noted 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.[37]

Figure 7 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). Declines in productivity in response to shocks to 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 that bigger destruction may actually contribute to bigger productivity, partially offsetting the negative effects of the shocks that operate through channels other than reallocation. It should

[36] 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.

[37] 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.

be noted that here we are measuring the contribution to manufacturing productivity of intra- and inter-interindustry reallocations together.

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. While there is substantial inter-industry heterogeneity in the estimated contribution of aggregate and sectoral gross job flows to sectoral productivity, the latter falls less (grows more) decline more for a majority of industries in response to the different shocks when changes in job flows are allowed. 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 than when inter-sectoral reallocation is also allowed (save for the case of shocks to the cost of capital).

These findings suggest the desirability, from an efficiency point of view, of the introduction of institutions that facilitate both intra- and inter-sectoral reshuffling of manufacturing jobs in response to different shocks. This point has to be obviously balanced with the social costs of job restructuring, about which this paper has nothing to say.

6. ECONOMIC REFORMS, JOB FLOWS AND PRODUCTIVITY

In this section we take up the broader question of whether reforms in general altered

the nature of job flows and their responses to the different shocks. We start by recalling the natures of the reforms that prevailed during the 1991-1994 and 1995-2001 sub-periods (see Section 2) and inspect whether there were noticeable changes in gross job flows and productivity from sub-period to sub-period and if these changes were consistent with the leading reforms. We then test for structural breaks in the coefficients of the aggregate sub-system of the VAR estimated in Section 4 and compare the impulse-response functions of gross job flows across sub-periods to see if they are consistent with the reforms.

6.1. Job flows, productivity and reforms by sub-period

The discussion of the job dynamics and of the behavior of the financial and policy variables presented in Sections 2 and 3 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 more flexible labor regulations.

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 (see Section 2).

Table 10 shows that during 1991-1994 the biggest establishments displayed the largest 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 1997-2001 the largest production units featured 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 1991-94 restructuring made large firms more resilient to the adverse shocks that occurred later, while the more flexible environment after 1995 facilitated bigger reallocation by the smaller establishments.

Mercosur, increased access to credit and a more flexible labor market appear to have favored 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 plants in low export share industries.

It is also worth noticing that the peaks and troughs in aggregate manufacturing labor productivity growth respectively coincided with the troughs and peaks in net employment growth between 1991 and 1995, while the opposite happened between 1996 and 2001 (see Figures 1 and 2). This suggest that during the first period productivity may have varied cyclically due to adjustment costs and/or variation in factor utilization rates. Instead, the more flexible environment of the second sub-period is consistent with the comovement between net employment growth and productivity, which coincides with the bigger reallocation rates and increased correlation between creation and destruction (see Figure 1). It is also worth recalling from Section 3 that the establishments in industries facing bigger import penetration experience the highest productivity growth in 1991 (14.6%), 1992 (19.1%), following the unilateral trade liberalization, and in 1996 (25%), at the onset of Mercosur.

6.2. Structural break test and changes in job dynamics

We now test whether there was a structural break in our VAR coefficients in the first quarter of 1995.[38] Given our small sample size, we are limited in two respects. First, we can

[38] Our sample is too short, and reforms of different intensity overlapped at most times, to split it into several sub-periods. Hence we concentrate on testing if, based on our visual and correlation analysis, there is indeed a break in 1995.

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.[39]

The results of the test weakly support this hypothesis. Table 12 shows 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.

Figure 8 compares the impulse response functions of the aggregate sub-system for 1995-2001 and for 1991-2001. The shocks to the user cost of capital after 1995 induce a bigger 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 lead to bigger rises in destruction, and bigger declines in creation, reallocation and net employment growth. The response of destruction to NWLC shocks does not change significantly, but these shocks now induce an increase in creation and net growth, and a larger rise in reallocation.

The bigger rise in destruction after 1995 is consistent with the more flexible labor regulations. This bigger flexibility also appears to have facilitated the bigger synchronization of

[39] 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 $F(n1, n2\text{-}K) = [(e^{*}\,e^{*} - e\,e)/n1]/[e\,e/(n2\text{-}K)]$, where e^{*} are the restricted residuals, e the unrestricted residuals and $n2$ is the number of observations for the longer sub-period.

creation and destruction and the larger reallocation in response to NWLC shocks. The bigger decline in reallocation and in net employment growth in response to shocks to the cost of capital suggest that the larger reliance on banking credit (and the associated balance sheet effects) led to bigger negative profitability shocks and larger increases in the marginal cost of creation that outweighed the pro-reallocation effects of the more flexible labor regulations.[40]

7. CONCLUSIONS

This paper has explored the effects of economic reforms and policy shocks on the dynamics of manufacturing jobs and productivity in Argentina during the 1990s. It has further inquired into the roles played by sectoral characteristics in shaping the responses of job flows and productivity to different shocks. This research has also dealt with the contribution of job reallocation to productivity. The main findings are summarized next.

Reductions in non-wage labor costs are found to mostly lead to smaller job destruction and reallocation and to bigger net growth, suggesting that they work through the preservation of existing jobs rather than through the incentives to create new jobs. These reductions especially favor the more labor-intensive industries.

Adverse shocks to the user cost of capital lower job creation, net employment growth and productivity and raise destruction. These shocks have a more negative effect in those that depend more on banking credit and/or are more capital-intensive.

The most frequent effect of bigger sectoral tariffs is to lower job destruction, reallocation and productivity and increase net employment growth, thus appearing to protect

[40] It is also possible that, after 1995, 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.

obsolete jobs. The reductions in reallocation are bigger industries that face bigger import penetration.

To the extent that differences in sectoral levels of protection may make some industries more closed to trade than others, protectionism appears as an important barrier to reallocation.

Increased reallocation within the manufacturing sector as a whole is seen to contribute to bigger increases (or smaller declines) in productivity. The evidence in favor of a positive contribution of intra-sectoral reallocation to productivity is more mixed. This would suggest the desirability, from an efficiency point of view, of the introduction of institutions that facilitate both intra- and inter-sectoral reshuffling of manufacturing jobs.

The reforms in the areas of trade policy (formation of Mercosur) and labor markets (lower taxation and more flexibility) after 1995, together with the increased reliance on banking credit, seemed to change the natures of job flows and productivity and their responses to the different shocks. The 1991-1994 privatizations provoked large destruction and reallocation in the largest establishments, but this restructuring appeared to make them more resilient to the adverse shocks in the second half of the decade. The more flexible environment after 1995 facilitated instead bigger reallocation by the smaller establishments, which were more vulnerable to shocks. This more flexible environment was also associated to bigger job reallocation and synchronization between creation and destruction, and to a comovement between net employment growth and productivity. Additionally, Mercosur, increased access to credit and more flexible labor markets appear to have favored establishments operating in industries with high export shares.

The post-1995 bigger labor market flexibility also appeared to make destruction more responsive to negative profitability shocks and to lead to a bigger synchronization of creation and destruction in response to non-wage labor shocks. Net employment growth and reallocation decline more in response to adverse shocks to the cost of capital, which is consistent with the bigger reliance on banking credit and the bigger sensitivity to losses of international competitiveness due to Mercosur.

Annex I. Definition and construction of variables

Gross job flows and productivity:

The rate of net employment growth for each industrial location is defined as:

$$Net_{it} = 2\frac{E_{it} - E_{it-1}}{E_{it} + E_{it-1}}$$

where E_{is} represents location *i* employment level in period *s*. The statistics for aggregate net and gross job flows are constructed in the following way:

$$Net\ Growth_t \equiv Net_t = \sum f_{it} Net_{it}$$

$$Job\,\mathrm{Re}allocation \equiv Sum_t = \sum f_{it} / Net_{it} /$$

$$Job\ Creation_t \equiv Pos_t = \sum f_{it} \max(Net_{it};0)$$

$$Job\ Destruction_t \equiv Neg_t = \sum f_{it} \min(Net_{it};0)$$

where the weight used for aggregation purposes is

$$f_{it} = \frac{E_{it} + E_{it-1}}{\sum_i (E_{it} + E_{it-1})}$$

Non-wage labor costs:

Following Mondino and Montoya (1998), our measure of non-wage labor costs is defined as the sum of labor taxes and expected severance payments. Labor taxes include pension funds, family allowances, and contributions to the health care system.[41] 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

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

by the probability that the worker will be entitled to receive a severance payment.[42] 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.

Sectoral import tariffs:

Sectoral and average effective nominal import tariffs were obtained from disaggregate data, at 5 digits, ISIC Rev 2[43]. 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[44], the Secretary of Foreign Trade of the Argentine Ministry of Economy and the decrees that modify tariffs.

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 mostly driven by the fluctuations in the world prices of agricultural commodities and oil and oil products, which make up most of Argentine exports.

The user cost of capital

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[42] 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).

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

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

The user cost of capital was computed as suggested by Hall and Jorgensen (1967): $r(t) = P^k(t)(R(t) + d(t))$, where $R^K(t)$ is the real interest rate at time t. $P^K(t)$ is the price of capital at time t.[45] d is the depreciation rate, constructed as a weighted average of capital specific depreciation rate.[46] 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.

Workers' appropriations of quasi-rents

Workers' bargaining power will be proxied by their appropriation of quasi-rents. 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.

Annex II. Econometric specification and identification

The VAR we estimate is:[47]

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

[45] 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.

[46] 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.

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

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. 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.[48] 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. The e_a disturbance represents the innovation to aggregate productivity that is orthogonal to the terms-of-trade innovations and to the aggregate job creation and destruction innovations.[49] 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. e_q represents the innovation to autonomous decisions regarding labor taxes and regulations. e_t represents 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

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[48] 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.

[49] 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.

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.

Our restrictions on B_0 and the assumed causal ordering allow us to: a) identify, and control for, the main determinants of manufacturing job creation and destruction and labor productivity, b) identify the reallocative and productivity effects of autonomous shocks to the user cost of capital, NWLC and sectoral tariffs, and establish whether these cyclical and policy shocks have allocative or aggregate effects. As in Davis and Haltiwanger (2001), 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.[50]

[50] 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.

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

Quarterly Job Flow Rates by Sector. Summary Statistics III.1991-IV.2001

Industry	Employment Share	Mean Job Creation Rate	Mean Job Destruction Rate	St. Dev. Job Creation Rate	St. Dev. Job Destruction Rate	St. Dev. of Employment Growth Rate	Correlation of Job Creation and Destruction
Total Manufacturing	100%	3.3	4.4	0.6	0.8	1.3	-0.11
15 - Food products and beverages	27%	5.6	6.6	1.0	1.2	1.5	0.08
16 - Tobacco products	1%	15.5	17.2	13.5	7.4	12.9	-0.20
17 - Textiles	7%	3.4	4.7	1.2	1.6	2.1	-0.10
18 - Wearing apparel; dressing and dyeing of fur	4%	2.2	4.2	1.2	1.7	2.2	-0.17
19 - Tanning and dressing of leather; footwear, etc.	5%	2.3	4.0	1.1	2.2	2.6	-0.09
20 - Wood and of products of wood	2%	3.0	4.2	2.0	2.4	3.4	-0.24
21 - Paper and paper products	3%	2.1	3.2	1.1	1.3	1.8	-0.14
22 - Publishing, printing and reproduction of recorded media	3%	2.5	2.3	1.4	1.2	2.2	-0.44
23 - Coke, refined petroleum products and nuclear fuel	1%	0.8	4.1	0.6	5.5	5.5	0.19
24 - Chemicals and chemical products	6%	1.8	2.8	0.6	0.8	1.1	-0.18
25 - Rubber and plastics products	5%	2.5	3.2	0.7	1.1	1.5	-0.33
26 - Other non-metallic mineral products	5%	1.5	3.2	0.7	2.0	2.3	-0.23
27 - Basic metals	5%	1.5	2.9	0.7	1.7	2.0	-0.14
28 - Fabricated metal products, except machinery and eq.	5%	2.8	4.5	1.2	2.0	2.7	-0.34
29 - Machinery and equipment n.e.c.	6%	2.8	4.0	1.1	1.2	1.8	-0.18
30 - Office, accounting and computing machinery	0%	2.9	2.9	1.7	2.5	2.4	0.37
31 - Electrical machinery and apparatus n.e.c.	3%	2.3	3.9	1.2	1.7	2.3	-0.26
32 - Radio, television and communication equipment	1%	3.2	4.5	3.1	3.6	5.5	-0.33
33 - Medical, precision and optical instruments	1%	1.9	3.9	1.4	3.5	3.6	0.09
34 - Motor vehicles, trailers and semi-trailers	8%	1.9	3.0	1.2	1.7	2.6	-0.55
35 - Other transport equipment	1%	8.1	5.7	20.9	3.9	21.2	0.02
36 - Furniture; manufacturing n.e.c.	2%	3.0	4.1	2.2	2.4	3.9	-0.42

Table 3

Aggregate variables. Summary Statistics III.1991-IV.2001

Variable	Mean	Std. Dev.	Min	Max	Correlations					
					Terms of Trade	Cost of Capital	Labor Cost	Job Creation	Job Destr.	Product.
Terms of Trade	102.4	5.1	93.0	112.1	1.00	0.33	-0.44	-0.02	-0.30	0.52
User cost of Capital	0.2	0.1	0.0	0.5	0.33	1.00	-0.17	-0.30	0.37	0.44
Non wage labor cost	0.5	0.0	0.4	0.5	-0.44	-0.17	1.00	-0.19	0.04	-0.68
Agg. Job Creation	3.3	0.6	2.0	5.2	-0.02	-0.30	-0.19	1.00	-0.11	0.20
Agg. Job Destruction	4.4	0.8	2.2	6.6	-0.30	0.37	0.04	-0.11	1.00	0.32
Agg. Productivity	92.3	13.4	66.9	112.9	0.52	0.44	-0.68	0.20	0.32	1.00

Table 4: 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 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:		User Cost of Capital				Nom Wage Labor Cost				Tariffs			
		Short run		Long run		Short run		Long run		Short run		Long run	
		% Sectors	% Empl.	% Sectors	% Emplo.	% Sectors	% Emplo.	% Sectors	% Emplo.	% Sectors	% Emplo.	% Sectors	% Emplo.
Productivity	Increase	30.0	43.6	30.0	43.6	40.0	31.5	40.0	31.5	30.0	46.9	30.0	46.9
	Decrease	70.0	55.7	70.0	55.7	40.0	60.2	40.0	60.2	60.0	49.5	60.0	49.5
	No change	-	-	-	-	20.0	7.6	20.0	7.6	10.0	3.0	10.0	3.0
Creation	Increase	-	-	-	-	45.0	52.1	45.0	52.1	30.0	22.4	30.0	22.4
	Decrease	95.0	98.7	95.0	98.7	55.0	47.2	55.0	47.2	70.0	77.0	70.0	77.0
	No change	5.0	0.7	5.0	0.7	-	-	-	-	-	-	-	-
Destruction	Increase	65.0	46.5	65.0	46.5	85.0	88.2	85.0	88.2	40.0	34.1	40.0	34.1
	Decrease	35.0	52.9	35.0	52.9	15.0	11.1	15.0	11.1	60.0	65.3	60.0	65.3
	No change	-	-	-	-	-	-	-	-	-	-	-	-
Net Growth	Increase	5.0	3.0	5.0	3.0	20.0	13.5	20.0	13.5	45.0	57.2	40.0	56.5
	Decrease	95.0	96.4	95.0	96.4	80.0	85.9	80.0	85.9	55.0	42.1	60.0	42.8
	No change	-	-	-	-	-	-	-	-	-	-	-	-
Reallocation	Increase	40.0	21.6	40.0	21.6	75.0	72.9	80.0	79.1	30.0	23.7	30.0	23.7
	Decrease	60.0	77.8	60.0	77.8	25.0	26.5	20.0	20.2	70.0	75.6	70.0	75.6
	No change	-	-	-	-	-	-	-	-	-	-	-	-
Equal sign of C & D		40.0	53.5	40.0	53.5	40.0	55.5	40.0	55.5	50.0	54.3	50.0	54.3
Abosolute value of C <		45.0	24.5	45.0	24.5	65.0	65.8	70.0	72.0	75.0	80.9	70.0	80.2

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

Non-wage Labor Cost

	Employment				Reallocation				Productivity			
	1	2	3	4	1	2	3	4	1	2	3	4
Labor-Intensity	-0.072	-0.050	-0.082	-0.069	-0.049	-0.038	-0.052	-0.044	0.129	0.161	0.120	0.132
	(0.10)	(0.30)	(0.09)	(0.13)	(0.03)	(0.06)	(0.05)	(0.08)	(0.08)	(0.05)	(0.14)	(0.09)
Access to Credit	-0.084	-0.016	-0.067	-0.076	-0.021	0.010	-0.009	-0.005	0.084	0.180	0.116	0.097
	(0.18)	(0.79)	(0.30)	(0.25)	(0.48)	(0.68)	(0.79)	(0.90)	(0.41)	(0.09)	(0.29)	(0.38)
Workers Strength	-0.030	-0.019	-0.030	-0.033	-0.002	0.006	-0.002	-0.001	-0.016	0.001	-0.015	-0.019
	(0.22)	(0.51)	(0.26)	(0.22)	(0.85)	(0.63)	(0.91)	(0.92)	(0.70)	(0.99)	(0.74)	(0.66)
Degree of Opennes	0.007				0.003				0.010			
	(0.021)				(0.02)				(0.05)			
Export Share		0.014				0.016				0.020		
		(0.29)				(0.01)				(0.33)		
Import Penetration			0.030				0.013				0.038	
			(0.06)				(0.11)				(0.14)	
Sectoral Trade Balance				-0.006				-0.002				-0.009
				(0.06)				(0.26)				(0.10)

Tariff

	Employment				Reallocation				Productivity			
	1	2	3	4	1	2	3	4	1	2	3	4
Labor-Intensity	0.074	0.051	0.091	0.073	0.027	-0.017	0.056	0.025	-0.051	-0.028	-0.054	-0.041
	(0.16)	(0.37)	(0.10)	(0.18)	(0.63)	(0.81)	(0.34)	(0.67)	(0.66)	(0.80)	(0.67)	(0.74)
Access to Credit	0.118	0.048	0.113	0.113	-0.005	-0.135	-0.019	-0.011	-0.223	-0.156	-0.193	-0.191
	(0.13)	(0.52)	(0.14)	(0.16)	(0.95)	(0.16)	(0.81)	(0.90)	(0.20)	(0.30)	(0.26)	(0.28)
Workers Strength	-0.004	-0.016	-0.003	-0.001	0.092	0.071	0.094	0.098	-0.006	0.010	-0.004	-0.004
	(0.89)	(0.65)	(0.93)	(0.97)	(0.01)	(0.11)	(0.01)	(0.01)	(0.94)	(0.88)	(0.96)	(0.95)
Degree of Opennes	-0.007				-0.013				0.007			
	(0.05)				(0.00)				(0.34)			
Export Share		-0.012				-0.019				0.031		
		(0.45)				(0.33)				(0.33)		
Import Penetration			-0.037				-0.066				0.025	
			(0.05)				(0.00)				(0.53)	
Sectoral Trade Balance				0.007				0.013				-0.004
				(0.083)				(0.01)				(0.604)

Cost of Capital

	Employment				Reallocation				Productivity			
	1	2	3	4	1	2	3	4	1	2	3	4
Labor-Intensity	0.049	0.050	0.044	0.053	-0.091	-0.083	-0.090	-0.088	-0.177	-0.203	-0.184	-0.177
	(0.14)	(0.12)	(0.20)	(0.12)	(0.01)	(0.02)	(0.02)	(0.02)	(0.12)	(0.08)	(0.13)	(0.12)
Access to Credit	-0.075	-0.073	-0.082	-0.065	0.010	0.034	0.023	0.017	0.072	-0.007	0.023	0.070
	(0.13)	(0.09)	(0.09)	(0.18)	(0.83)	(0.44)	(0.64)	(0.73)	(0.65)	(0.96)	(0.88)	(0.66)
Workers Strength	0.000	0.002	-0.002	0.001	0.000	0.004	0.001	-0.001	-0.037	-0.048	-0.041	-0.032
	(0.98)	(0.93)	(0.93)	(0.96)	(0.98)	(0.82)	(0.97)	(0.98)	(0.57)	(0.47)	(0.53)	(0.62)
Degree of Opennes	0.000				0.002				-0.008			
	(0.86)				(0.26)				(0.28)			
Export Share		0.007				0.008				-0.010		
		(0.39)				(0.38)				(0.74)		
Import Penetration			0.006				0.007				-0.018	
			(0.59)				(0.05)				(0.64)	
Sectoral Trade Balance				0.001				-0.002				0.008
				(0.79)				(0.55)				(0.31)

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

Structural Break Test

Level of significance at which null hypothesis of subsample stability is rejected

Equation	Constant and Variable:						All
	TOT	*Creation*	*Destruction*	*Pruductivity*	*CK*	*NWLC*	
TOT	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%
NWLC	0.1%	0.1%	0.1%	0.0%	0.0%	0.1%	0.0%

Note: TOT = terms of trade; CK = cost of capital; NWLC = nom wagw labor cost

Figure 1: Aggregate Manufacturing Gross and Net Job Flows

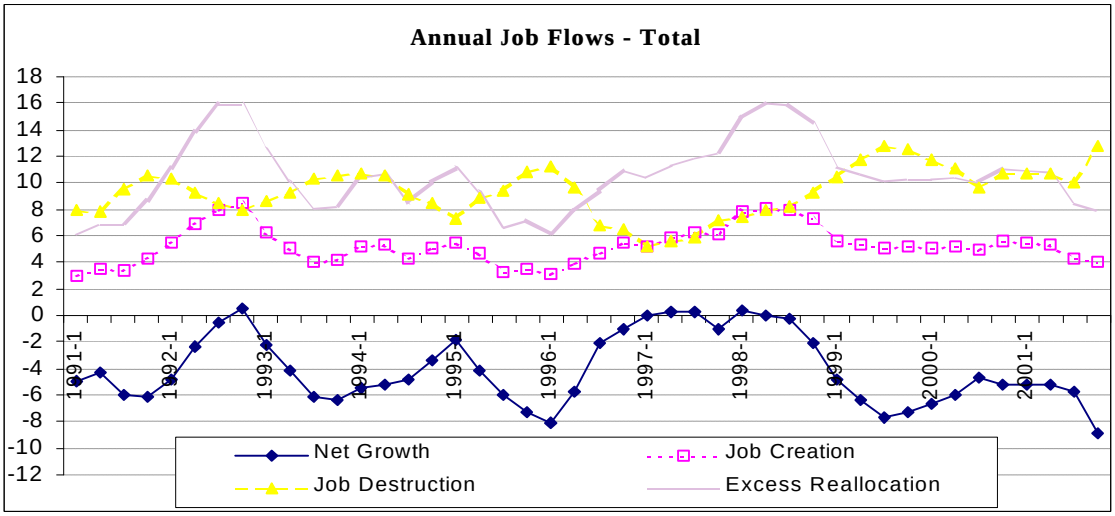


Figure 2: Annual Manufacturing Labor Productivity Growth Rates

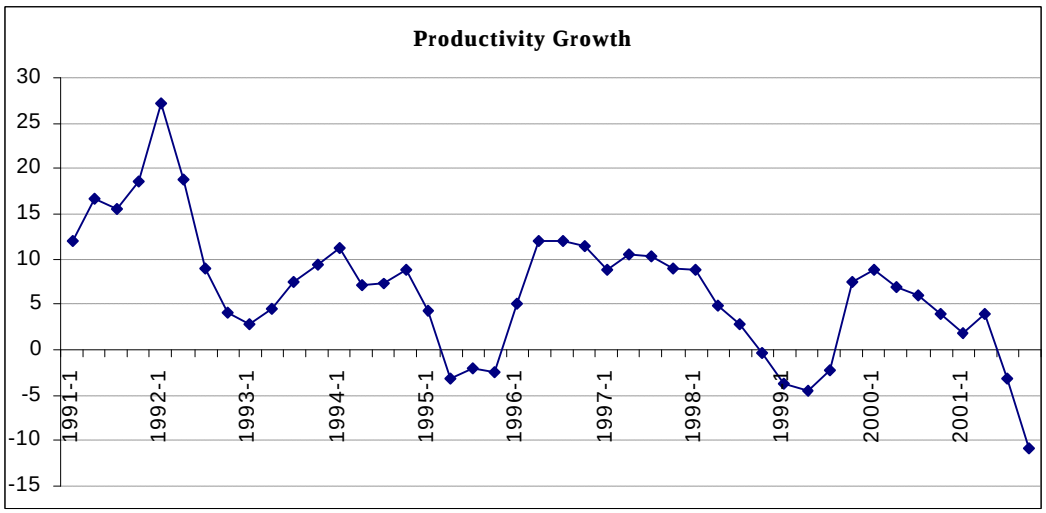


Figure 3

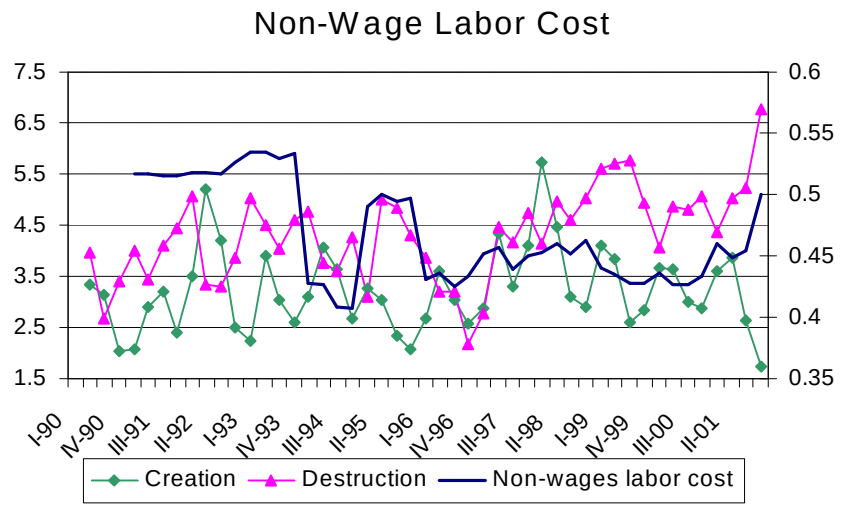


Figure 4

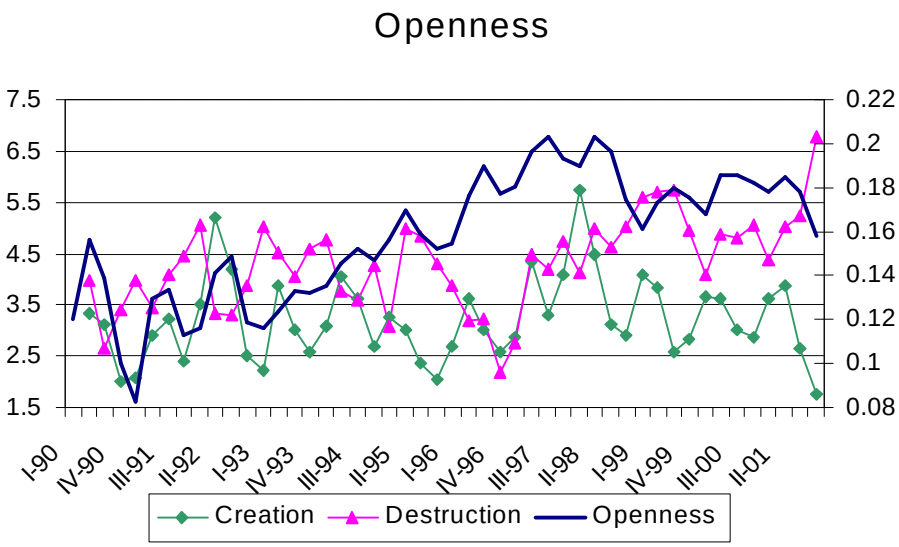


Figure 5

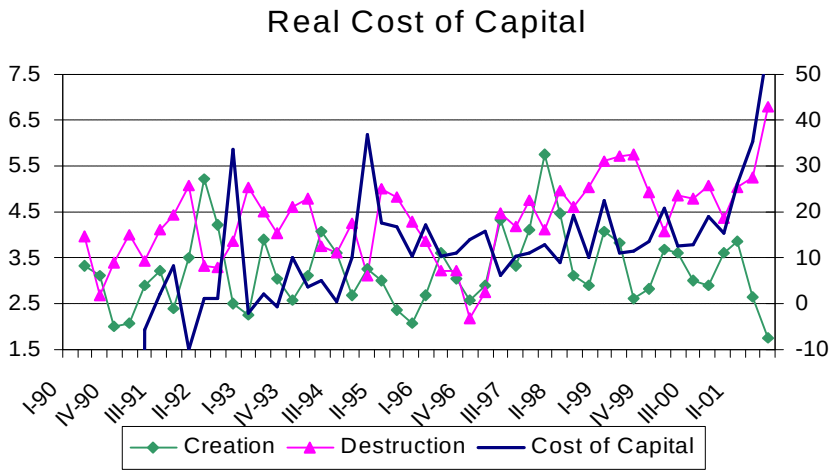
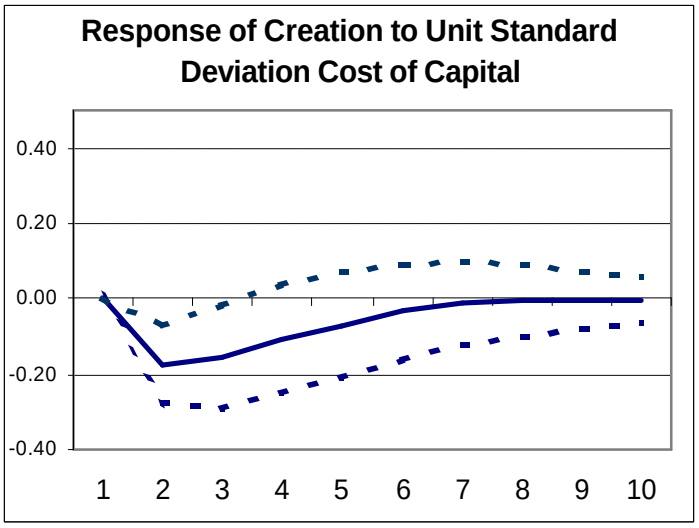
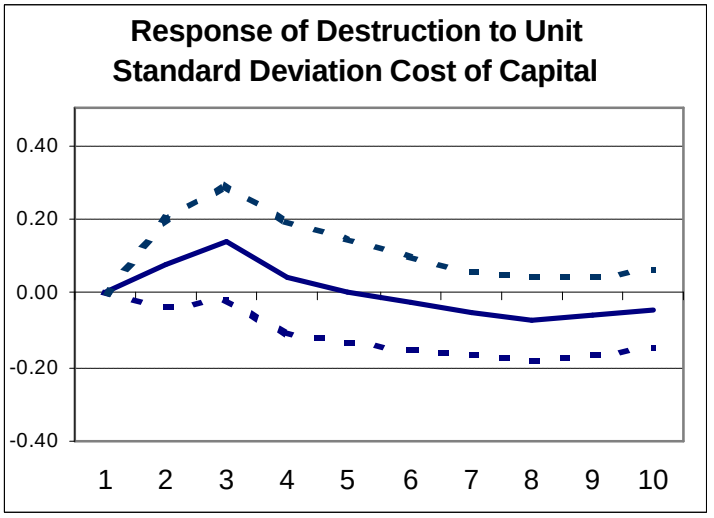
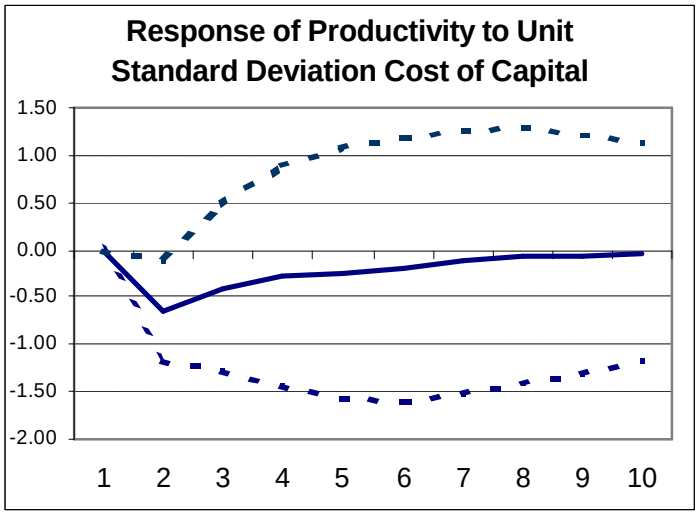
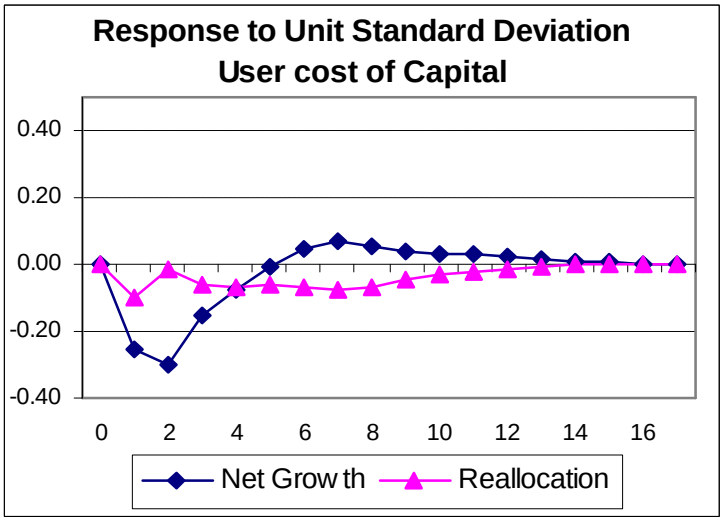


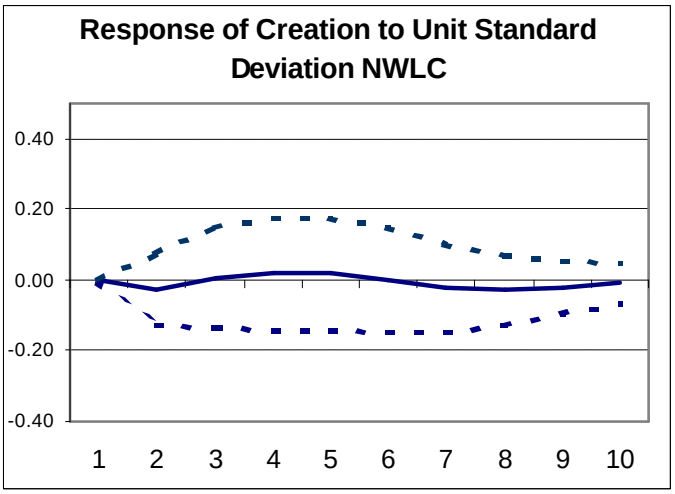
Figure 6: : Impulse Response Functions for Total Manufacturing

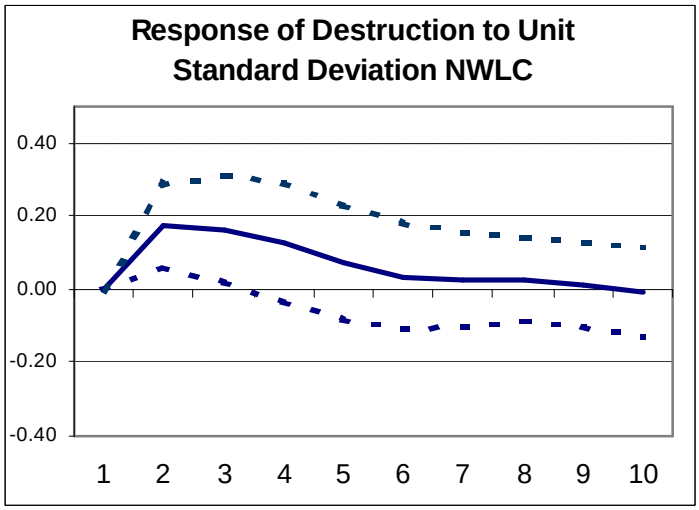


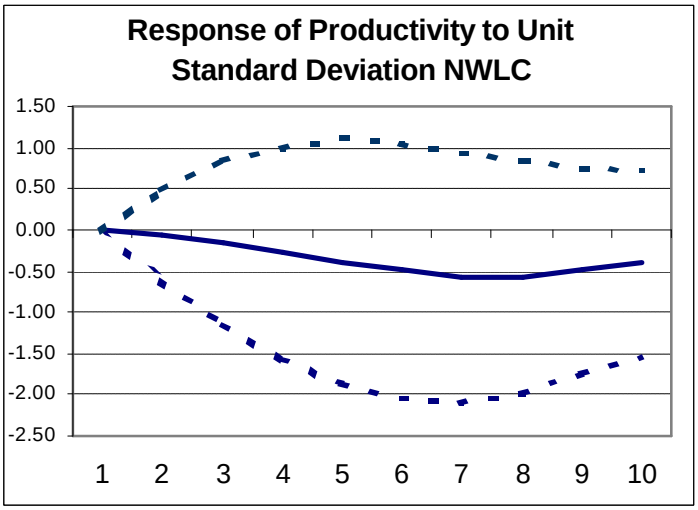







Response of Creation to Unit Standard Deviation NWLC
0.40
0.20
0.00
-0.20
-0.40
1 2 3 4 5 6 7 8 9 10


Response of Destruction to Unit Standard Deviation NWLC
0.40
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 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

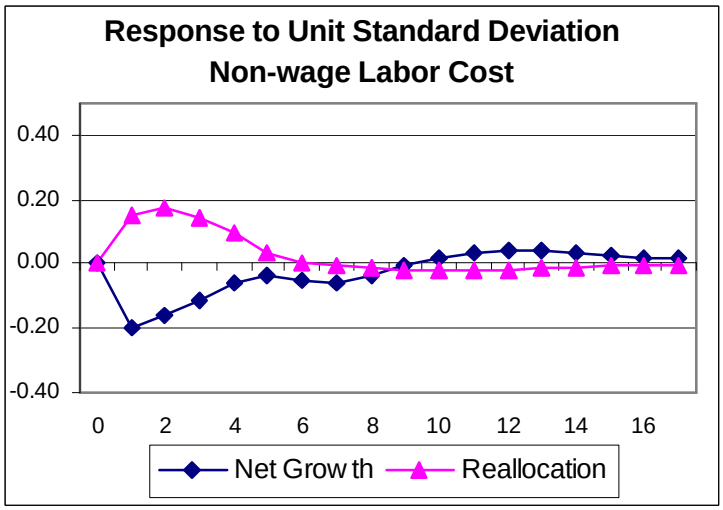
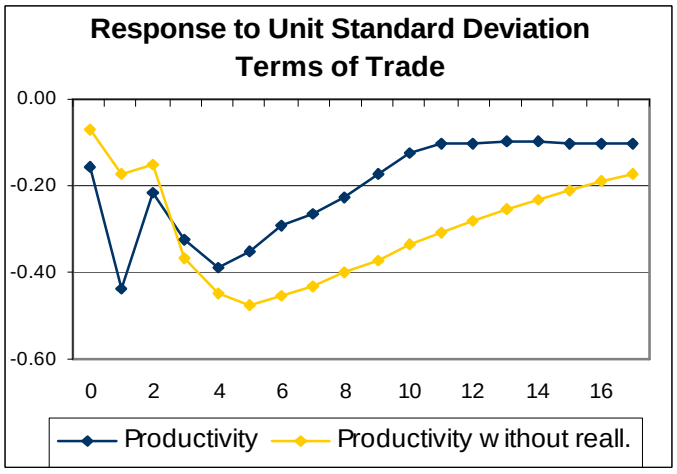
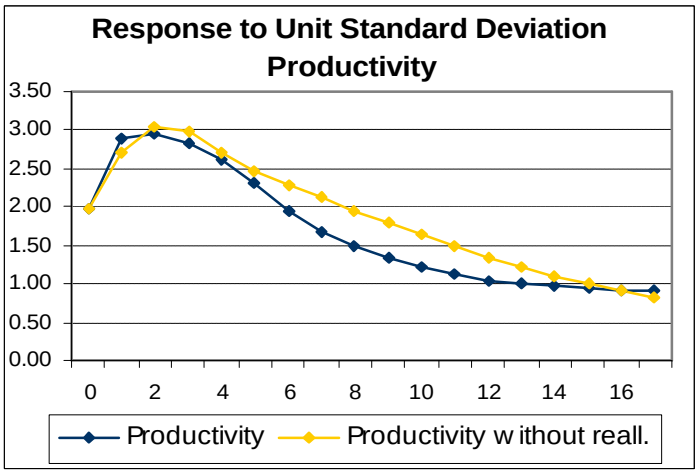
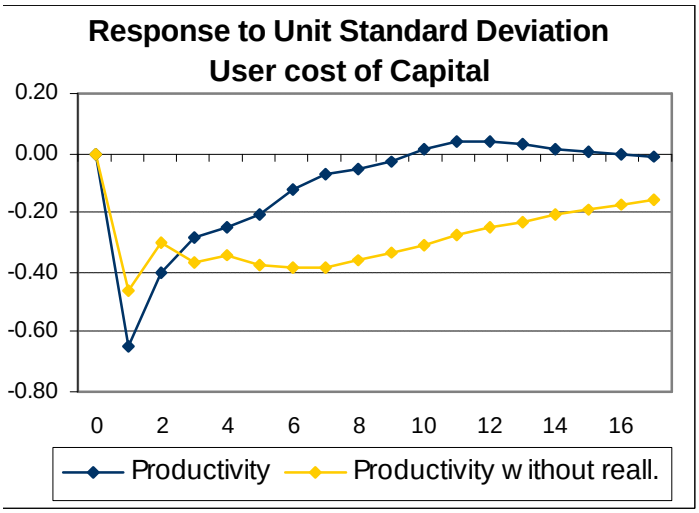
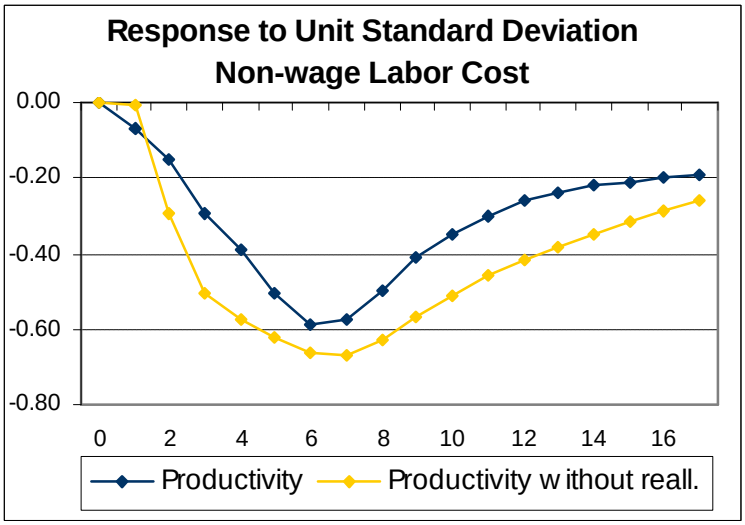

Response to Unit Standard Deviation Non-wage Labor Cost
0.40
0.20
0.00
-0.20
-0.40
0 2 4 6 8 10 12 14 16
Net Grow th
Reallocation

Figure 7: Aggregate effects of Reallocation in Productivity



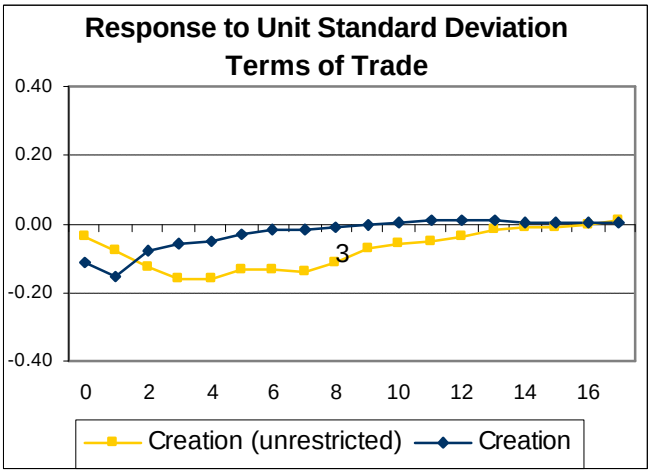


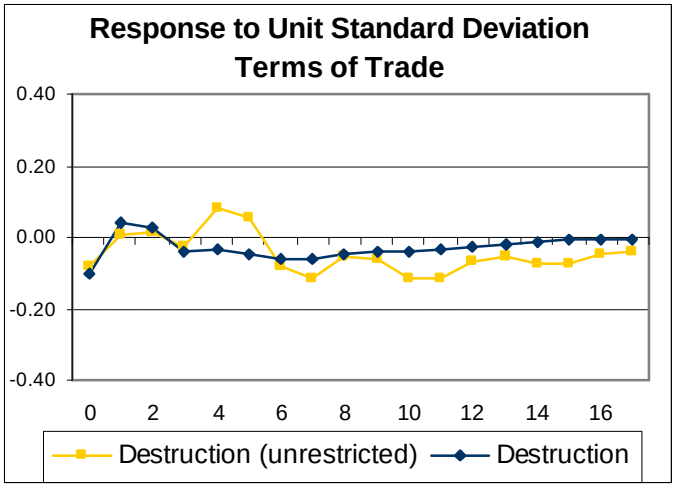


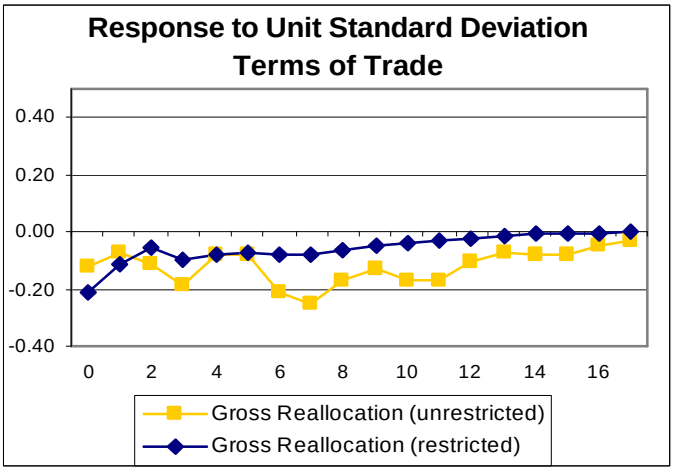


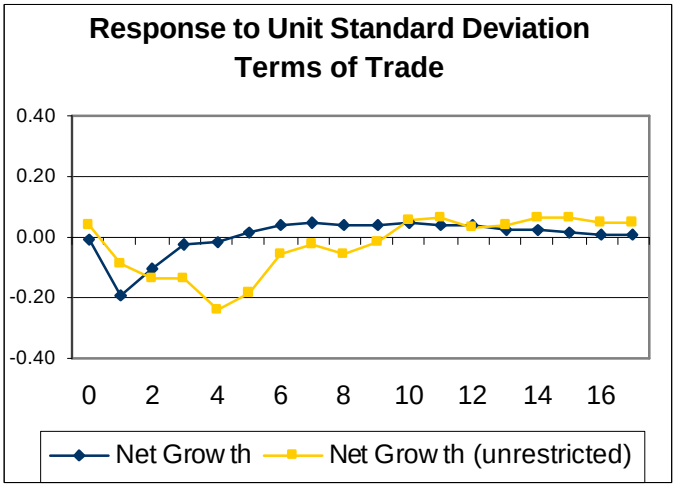
Dark line: productivity response in base line case
Light line: productivity response when job flows are shut-off

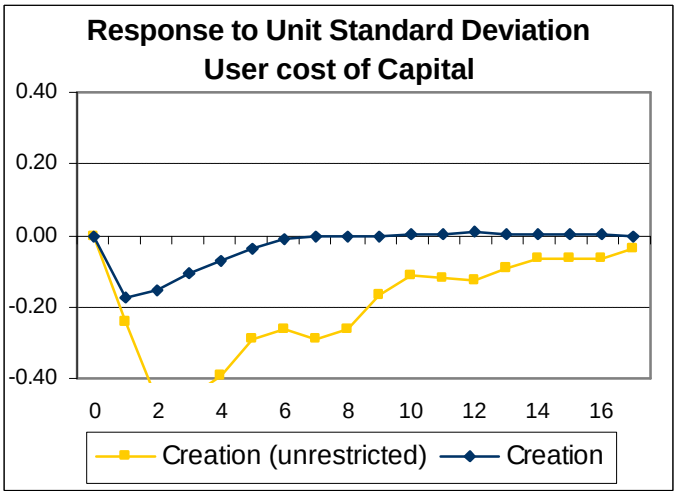
Figure 8: Impulse-Response Functions for Job Flows, restricted (1991-2001) VAR and unrestricted (1993-2001) VAR

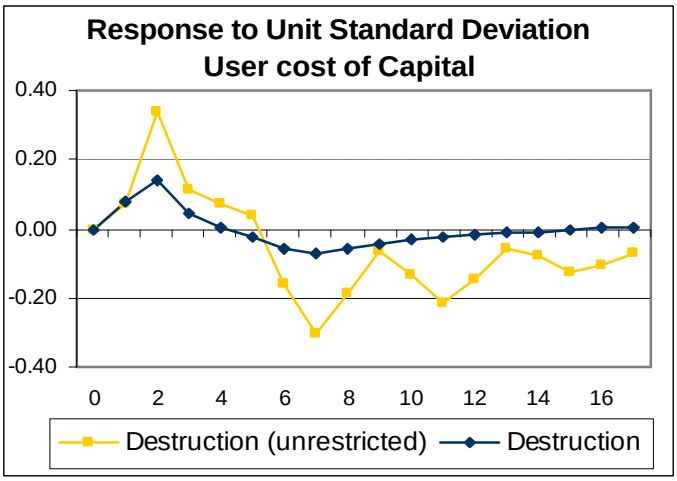


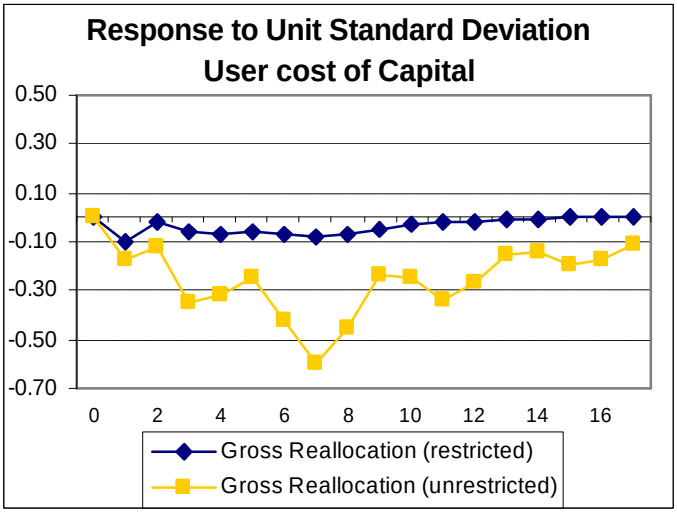


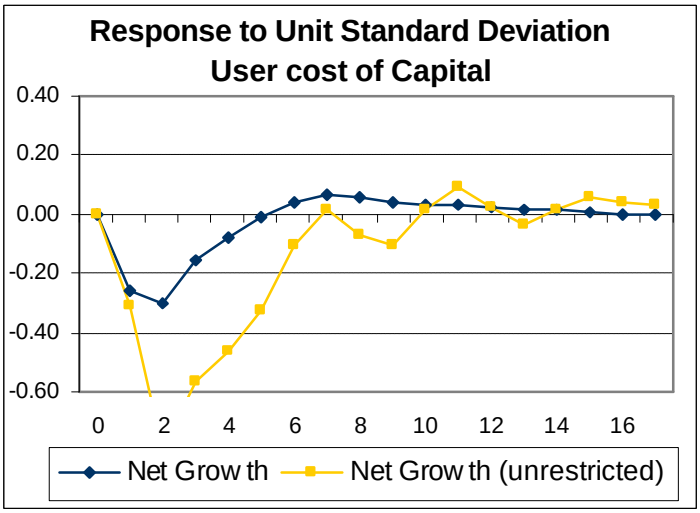


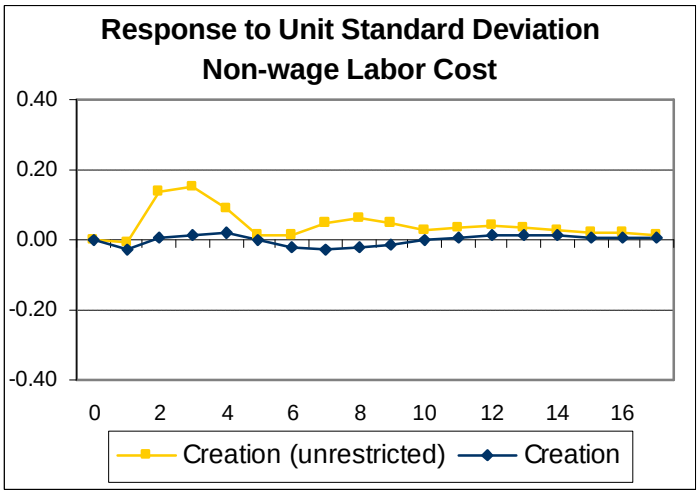


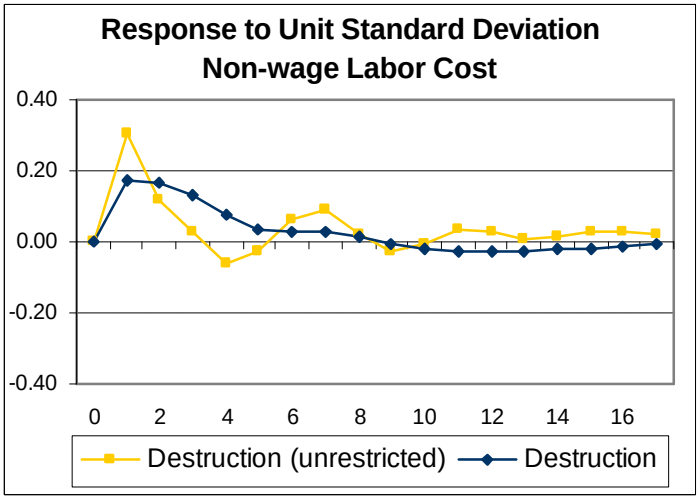

Response to Unit Standard Deviation
User cost of Capital
0.40
0.20
0.00
-0.20
-0.40
0 2 4 6 8 10 12 14 16
Creation (unrestricted)
Creation

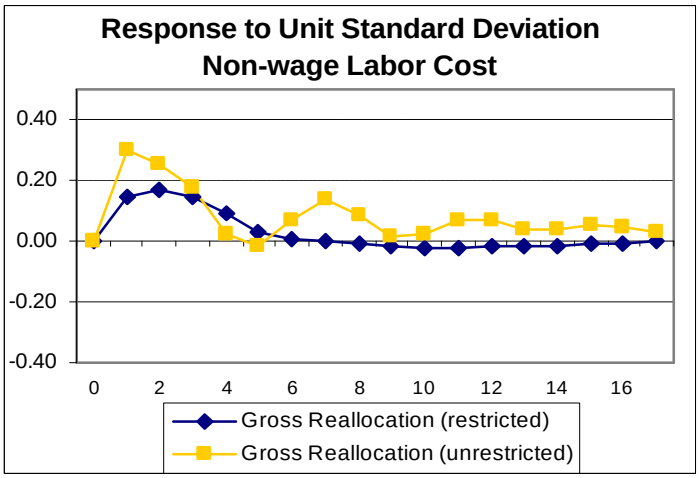

Response to Unit Standard Deviation
User cost of Capital
0.40
0.20
0.00
-0.20
-0.40
0 2 4 6 8 10 12 14 16
Destruction (unrestricted)
Destruction

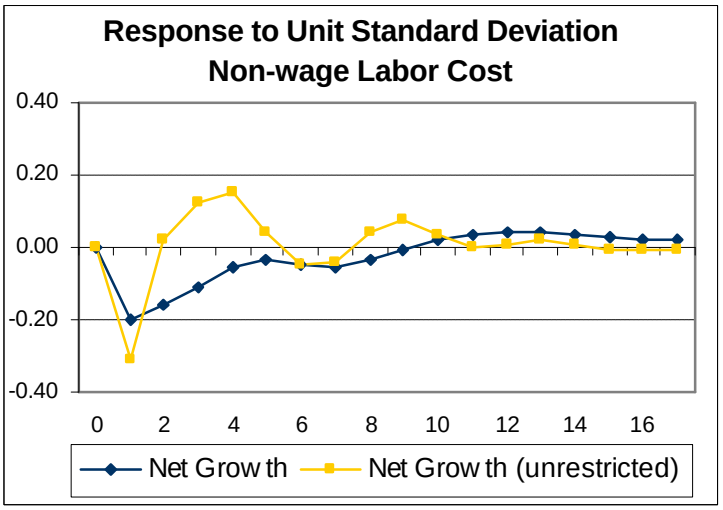

Response to Unit Standard Deviation
User cost of Capital
0.50
0.30
0.10
-0.10
-0.30
-0.50
-0.70
0 2 4 6 8 10 12 14 16
Gross Reallocation (restricted)
Gross Reallocation (unrestricted)


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
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
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
Gross Reallocation (restricted)
Gross Reallocation (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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