The stickiness of national competitiveness: Implications for Switzerland and beyond

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This paper postulates that a country's competitiveness is sticky, i.e. it does not react immediately to changes in underlying framework conditions. The causes of this stickiness can be categorized along three dimensions. First, there is a delay between policy actions and their impact on competitiveness *("pipeline effect")*. Second, visible reactions of firms to changes in framework conditions lag behind insofar as firms react relatively quickly on the margin, i.e. with new projects, but react only slowly with existing activities due to sunk-cost effects *("overflow effect")*. Third, as politics reacts only to visible changes in competitiveness, and given that these actions again need time to take effect, reactions are systematically delayed. Policymaking should take into account all three of these dimensions of stickiness to prevent major damage to a country's competitiveness. This is especially relevant in a small open economy like Switzerland, as the relatively small size of the home market compared to exports amplifies the effect of changes in framework conditions on competitiveness. We therefore conclude by presenting policy measures to help anticipate and dissipate the negative effects of stickiness.

JEL codes: R11, R38, R58
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1 Introduction

Switzerland's economic policy has been successful for many years; in fact, Switzerland is currently considered one of the most competitive countries worldwide by many accounts. For example, the World Economic Forum (WEF) Competitiveness Ranking has Switzerland top of the list in 2014 for the sixth time in a row. Nevertheless, the last years have seen several landmark decisions that have been criticized for having the potential to endanger Switzerland's economic success by worsening framework conditions.[1] So far there has been no visible effect on Switzerland's prosperity and its standing in competitiveness rankings. This observation might lead to the conclusion that those decisions had no negative impact on Switzerland's competitiveness and that the threat of a loss of competitiveness is being used by business representatives to support their interests.

1 Take as examples the federal popular initiative "against rip-off salaries" of 2013, aimed at controlling executive pay of companies listed on the stock market and increasing shareholders' say in corporate governance, or the initiative "against mass immigration", which will most probably put an end to the free movement of labor with the EU. Both have been accepted against the recommendation of Swiss business and despite the judgment that they will worsen framework conditions for companies, especially multinational enterprises (MNEs).

In this paper, we show that it is misleading to expect policy decisions on framework conditions to have any immediate effect on competitiveness. However, sudden adverse shocks, such as the current appreciation of the Swiss franc, can lead to abrupt shifts in perceived competitiveness as a threshold gets crossed and the sum of negative past events become visible. As the adages go: it is the last straw that breaks the camel's back, or the last drop that makes a barrel overflow.

We will demonstrate that the stickiness of competitiveness leads to a considerable delay between (policy) actions, their impact on framework conditions and the reactions of firms. We will further argue that this delay is especially dangerous for international business located in Switzerland, as mobile factors quickly react to worsening framework conditions. Thus we advocate that stickiness needs to be considered in the competitiveness and in the competitiveness policy of a location.

2 Defining competitiveness

Competitiveness is a term that is an ever-present part of the public debate in Switzerland, particularly now at a time when several landmark decisions with a major impact on the economy have been made through referendums. No matter what kind of policy change is discussed (from taxation to labor market reforms, from competition law to free trade) the respective advantages and disadvantages for the competitiveness of Switzerland play an important role in the debate. Take as an example the debate in the run-up to the vote on the 1:12 Initiative; if the initiative had been accepted, it would have restricted executive salaries to 12 times that of the lowest-paid employee (see, for example, Bardan, 2013). The supporters of the initiative frequently argued that business usually exaggerates the claim that Swiss competitiveness is at risk. We aim to show that the loss of competitiveness is a process that can continue for a long time without being picked up either by economic indicators or by the wider public because no reactions are observed on the part of the companies. It is the stickiness of company decisions in particular that stabilizes the *status quo* of the economy for a certain time. But once a tipping point is reached and companies start to react to the worsening framework conditions, the process is not easily reversed and this reinforces the loss of competitiveness that has already been suffered. Before we can come to this discussion, it is crucial to define the term "competitiveness" as used in this paper.

Competitiveness can be analyzed on three different levels: the level of companies, of industries and of countries. These levels can be analyzed separately, as will be done in this paper, where we focus on the country level. Nevertheless, they are interdependent – changes on each level have implications for competitiveness

on the two remaining levels. On the one hand, a country can only claim to be competitive if its domestic companies and industries are able to successfully compete on global markets. On the other hand, a country's framework conditions support or hamper the success of its domestic companies and industries to a significant extent. But there is also an important difference between the competitiveness of a *country* and the competitiveness of a *company*. While a company that loses competitiveness on the world market will go bankrupt and cease to exist, this is not the case for a country. Cases of country bankruptcies are rare, and never end with the country losing all available jobs or all its assets, as Argentina has just recently shown (again). Consequently, the competitiveness of a nation does not decide the existence of the state. States seek to be competitive in order to reach a high level of income.[2]

This statement is supported by early trade theory.[3] Ricardo (1817) showed that international trade is based not on absolute but on comparative advantages. This implies that competitiveness in terms of the ability to export is always given, but may come at the cost of devaluation or falling wages. Every country exports the goods for which it possesses a comparative advantage, without having the need for the most efficient production in the world. If a country is not able to export at given prices, market mechanisms will lead to an adjustment of the terms of trade, making the products of the country competitive again. This may be either by devaluation (if the exchange rate system allows for that) or by falling wages. Devaluation leads to a deterioration in the terms of trade for the country concerned. The same volume of exports will then buy fewer imports on international markets, which is equal to a real loss of income. A loss of income also results if there is a fall in the factor remuneration (usually wages) in order to compensate for the loss of productivity.[4] For a country, as opposed to a company, exchange rates and wages are not exogenously given variables. If a country accepts real losses of income due to adjustments of exchange rates and/or wages, it will always be able to export. But it is widely acknowledged that a country that is able to export solely due to constant devaluation is not competitive in any common sense of the term, and that a definition of competitiveness needs to incorporate the ability of a country to export and at the same time to achieve high living standards.[5] A prominent example is the definition in the report of the US President's Commission on Competitiveness (1984):

2 See the discussion in Borner, Dietler and Mumenthaler (1997).
3 See, for example, Jones (1980).
4 Empirically, falling wages have not often been observed in countries that are struggling with competitiveness issues. The example of Greece as member of the Eurozone shows how difficult it is to re-establish competitiveness if exchange rate mechanisms are not at hand (Thimann 2013).
5 High living standards can be achieved if the local real income level is high. As this can only be assured by high productivity of labor, Krugman (1994) concludes that competitiveness is "a funny way of saying productivity".

"A nation's competitiveness is the degree to which it can, under free and fair market conditions, produce goods and services that meet the test of international markets while simultaneously expanding the real incomes of its citizens".

Consequently, competitiveness is more than just the ability to export and should not be misunderstood as a zero-sum game in which a country can only gain competitiveness at the cost of another country. This can be explained by the primary characteristic of competition that leads to an ongoing enhancement of efficiency. To survive on the market, commercial actors need to constantly seek efficiency gains in order to offer products that are cheaper than those of their competitors or different in a way that justifies a higher price. This leads to an efficient use of resources at the national level. Trade then leads to even further efficiency gains through international division of labor, according to the respective comparative advantages of nations in Ricardian theory.

The ongoing and important efficiency gains emerge from innovation, be it product or process innovation. Whilst it is possible for innovation to happen in the private sector independently of the conditions in a country, it is widely established that the framework conditions in a country can actively support innovation in the private sector.[6] Here, competitiveness policy should target the traded sector of a nation, which is often dominated by multinational enterprises and small high growth entrepreneurial companies. This sector is responsible for a major share of private innovations. It has been shown for the United States by Delgado, Porter and Stern (2012) that firms in the traded sector account for 96.5% of the patents attributed to the private sector, but only 36% of the employment and 50% of the income.[7]

The recent dramatic increase in international factor mobility raises the importance of a competitiveness policy targeted at multinational companies. Multinational companies as parts of the traded clusters are more dependent on mobile factors (such as qualified labor) than local industries. But mobile factors choose locations where their requirements – in addition to the factor remuneration – are best met. This may be low risk for capital, or location attractiveness for qualified labor.[8] If a country's framework conditions do not attract the necessary mobile factors, the country risks the exit of mobile industries that depend on those factors. The impact on the competitiveness of a country is then at its greatest if the migrated industry makes a disproportionately large contribution to the country's productivity, which applies typically to multinational companies.

6 See, for example, Ezell and Atkinson (2012).

7 See also the Cluster Mapping project of Harvard Business School and the U.S. Economic Development Administration (http://www.clustermapping.us).

8 OECD (2008, p. 10) shows that the inflow of talent leads to a variety of positive effects related to knowledge flows and R&D. This is one way in which local framework conditions influence the capacity to innovate.

In conclusion, competitiveness is the ability to export, given a high level of domestic productivity and relatively good framework conditions that make the country attractive for mobile production factors.

3 Measuring competitiveness

The variety in the measures suggested to capture the notion of competitiveness is considerable. They differ depending on the context in which they are used and, more importantly, on the underlying interpretation of competitiveness. Many authors focus on the ability to export and choose measures that trace this central aspect of competitiveness for a country. Alternatively, productivity is also frequently a focus point. Such measures tackle important aspects of competitiveness but do not reflect on the complexity of the concept, which, as defined above, is multidimensional. Multidimensional measures, such as that published by the World Economic Forum, combine many one-dimensional measures with results of surveys in order to establish a comprehensive view on competitiveness.[9]

In addition to the distinction between one-dimensional and multidimensional measures, measures of competitiveness can be distinguished along four further dimensions according to Siggel (2006). The author identifies macro and micro concepts, static and dynamic interpretations, and measures that are deterministic or contain a stochastic component. Finally, he distinguishes concepts that measure competitiveness ex ante or ex post.

While micro indicators are specialized for the competitiveness of producers or industries (typically market shares or prices), macro indicators – suggested by Dollar and Wolff (1993) and Lipschitz and McDonald (1991), among others – may take the form of the real exchange rate or productivity. Real exchange rates show to what extent a currency is overvalued or undervalued and thus allow conclusions on competitiveness. Productivity is a proxy for competitiveness in the sense of the ability to export, as it is included in our above definition of competitiveness.

Measures of competitiveness can be further distinguished according to their static or dynamic character (Siggel, 2006). The market share of an industry is a static measure, while its growth (or its growth relative to the growth of the home country's global market share) has a dynamic aspect. Hatsopoulos, Krugman

9 The Institute of Management Development (IMD) also publishes a composite index. Further institutions that publish rankings of countries according to a multidimensional concept are the World Bank with its Doing Business index, and the Fraser Institute and the Heritage Foundation, which both measure "economic freedom."

and SUMMERS (1988) used market share as an indicator of US competitiveness in manufacturing, and diagnosed declining competitiveness because the international market share of US manufacturing was declining.

According to SIGGEL (2006), most concepts known in the literature are of a deterministic character, because they take into account actual values of measurable variables (e.g. market shares). Other concepts measure potential performance that is not observable directly. The latter concepts add an element of uncertainty to the measure and can thus be called stochastic. One example is the concept proposed by FAGERBERG (1988), who measures competitiveness (among other things) using R&D expenditure and patent applications, capturing the potential for future competitiveness that can then be measured by a growing market share. Closely related to this is the distinction between ex ante and ex post measures. A measure is ex post if it reveals successful competition (large or growing market share) and ex ante if it points to sources of future advantage that may not yet be realized (upgrading of infrastructure).

While some authors rely on single economic values to measure competitiveness, we believe that a multidimensional concept is best able to capture all aspects of our definition. The WEF and IMD rankings not only combine a large number of attributes from different sources, but their sub-indices also largely differ in their character. Take for example the sub-indices of the WEF Competitiveness Ranking – they can be static (domestic market size) or dynamic (inflation), and related to ex ante competitiveness (capacity for innovation) or ex post competitiveness (exports as a percentage of GDP). They are all condensed into one indicator.

While the aggregation method and the fact that such different indicators are combined have been a source of criticism in the literature (SIGGEL, 2006), we would like to point to a further caveat of these two prominent – and, to our knowledge, of any other – measures of competitiveness: none of them is able to capture the dynamics that arise from the different levels of stickiness that are responsible for the lag between policy actions and the resulting changes in competitiveness. Even though measures exist that are based on potential or future scenarios (such as the ex ante or stochastic measures), none of them takes into account the fact that policy measures or other actions concerning the conditions of the countries will inevitably change competitiveness in the future without a visible effect on competitiveness today.

Take for example the extract of the most recent WEF Competitiveness Report in Figure 1. Switzerland tops the ranking for the sixth time in a row, but the text already comments on the danger that might arise from the "yes" vote on the initiative "against mass immigration", which aims to end the free movement of

labor between Switzerland and the EU. This warning only adds to the difficulties that firms are already having in finding qualified labor, but the consequences will only become visible in a competitiveness ranking at some point in the future. We develop the concept of stickiness in the context of competitiveness in the next section and discuss the extent to which predictable changes in competitiveness can and should be foreseen by politics and research institutes.

Figure 1: Extracts of the 2013-2014 WEF Competitiveness Report

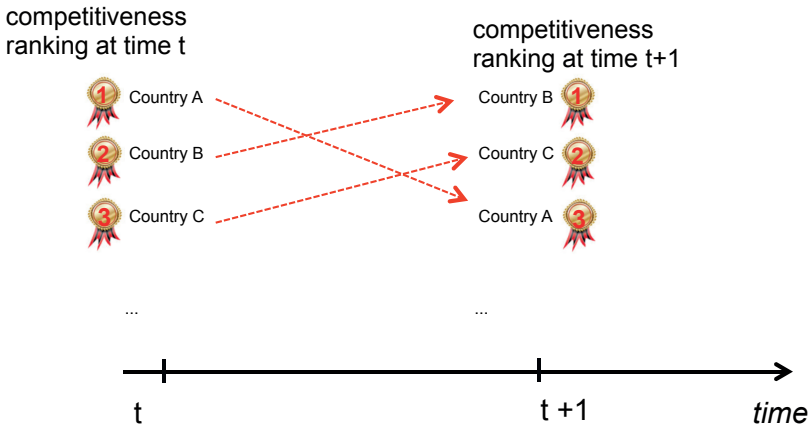
The Global Competitiveness Report 2014–2015: Country/Economy Highlights

scientists. Respondents to the Executive Opinion Survey 2014 cited the difficulty of finding qualified workers as the single most problematic factor for doing business in the country. The recent acceptance by Siwss citizens of an initiative aimed at limiting the ability of European Union (UN) workers to immigrate by reintroducing quotas could exacerbate the problem and erode Switzerland's competitiveness advantage.

4 Stickiness

Generally, our contention is that the competitiveness of a nation is sticky in the sense that changes to relevant framework conditions only show their impact on competitiveness after a certain time lag. This means that changes initiated in the past affect competitiveness in the future (at time t+1), whilst today's (time t) policy changes or other measures will have an influence on competitiveness at a later point in time (beyond t+1), as illustrated exemplary in Figure 2. If policy makers only act on the basis of competitiveness measured or perceived at time t, their deliberations may go awry. They will not take into account what "*is already in the pipeline*", i.e. the actions of the past that have implications for competitiveness in the future.

Figure 2: Stickiness of competitiveness and its influence on country rankings



In the following we will distinguish three dimensions of the "stickiness" of competitiveness.

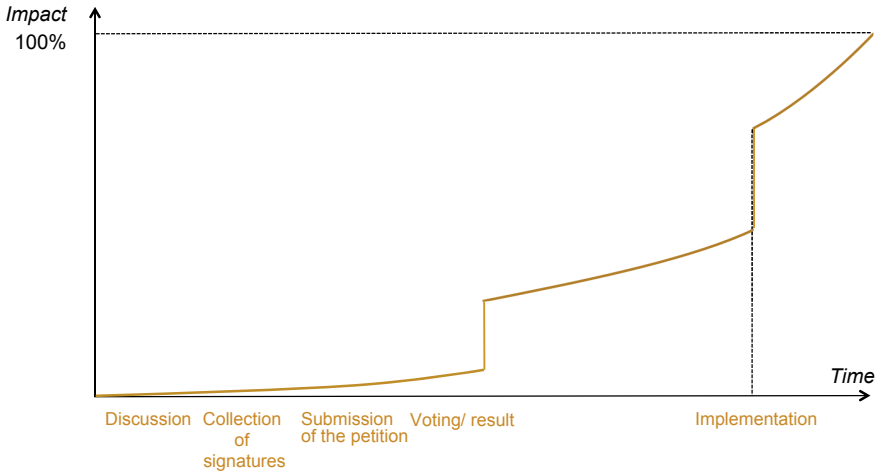
The first dimension of stickiness relates to the fact that changes in competitiveness do not happen with a single blow, but need time to be revealed and to develop their full magnitude. This is due to the political process, on the one hand, and to a high level of interdependence of the factors that define competitiveness on the other.

The second dimension relates to the way firms react to changes in competitiveness. We will argue that, while firms may react immediately, they do so in a way that is not visible outside of the company. This is because existing activities are rarely removed. While new investment decisions are evaluated at every point in time with the full information available, existing activities are relatively stable due to sunk costs. Insecurity or worsening framework conditions are an important argument in favor of alternative locations (or of delaying a decision). Visible reactions of firms to worsening framework conditions – such as the relocation of activities – will happen only if different factors that lead to worsening framework conditions add up in a way that justifies closing activities and accepting the sunk costs. Only at this late stage, when policy reactions are difficult, are the reactions of firms perceived and their full impact on the economy felt. While both dimensions reinforce each other, they also influence the third political dimension. The time lag between the cause of and the perceived adaptation to changes in competitiveness is the reason why political actions are delayed.

4.1 Dimension one: Manifestation

The first dimension of stickiness, "manifestation", concerns the first time lag that exists between a political decision and its full impact on the competitiveness of a country. It takes time before the impact of a political decision fully manifests itself and is taken into account by corporate decision makers. The Swiss popular initiative "against mass immigration" demonstrates this first dimension of stickiness. The vote on the initiative took place in February 2014, but its full impact on Swiss competitiveness cannot be expected until it has been implemented after three years (see Figure 3).

Figure 3: Manifestation: Impact chart for the Initiative against Mass Immigration



According to the initiative, quotas will have to be introduced to manage immigration from the EU. This will have direct effects on the framework conditions for companies that depend on foreign, mostly highly qualified, labor. Additional effects on framework conditions can be expected because the initiative also concerns Swiss-EU relations. The introduction of quotas for EU citizens in Switzerland violates the free movement of persons, a core principle of cooperation with the EU that is part of the bilateral agreements between the EU and Switzerland, which will potentially be at risk when the initiative is implemented.

Following the different steps in the political process, the impact of the initiative on Switzerland's competitiveness will steadily increase. The political process starts with the collection of signatures and ends with the implementation of the

initiative in law after three years. As shown in Figure 3, the impact can be expected to grow steadily. Only after the vote and the implementation of the initiative can abrupt changes in the impact be anticipated. The important individual stages are as follows. Migration first became a topic in the media and among the general public. The Swiss People's Party then announced that it was starting the collection of signatures. Arguably, once the initiative was submitted and the discussions around the topic intensified, certain risks could already be anticipated, although the impact on investors was still negligible. The significant effects on investment decisions began after the decision at the ballot box, as a decision is taken in principle but the details of implementation were still unknown, thus creating uncertainty. Further consequences followed once the Federal Council made clear in February 2015 how it plans to implement the constitutional article. The full impact, however, will only be realized during implementation.

Similar examples can be built around any other major policy decision that impacts framework conditions, and show that the central point about the first dimension of stickiness is that the full impact of processes that have been started only develops after a certain timespan. The future pattern can be subject to change if, in the above case for example, negotiations in the Swiss dialogue with the EU are crowned with success or doomed to failure, or if alternative ways of implementation are chosen. But much of the outcome is predetermined by the initial decision. A good metaphor for the first dimension of stickiness is a "*pipeline*" – what enters the pipeline at one end will eventually exit at the other end, but there is a time lag in between. It is crucial to anticipate this effect.

4.2 Dimension two: Perception and reaction of business

When a company relocates its activities to a foreign country it says something about the company's location strategy, but frequently it is also a statement about the home country's decreasing competitiveness, at least for the relocated activity. Such decisions gain media and public attention if conducted by large firms, especially if they involve layoffs at the original location, but they are not often observed.[10] Firms will relocate activities only if the conditions in the country have changed dramatically and/or continuously over a long period of time, such that losing the investments made in the old location and rebuilding activities in a new location become justifiable. The example of Fiat, a large car manufacturer with origins in the north of Italy, shows that a location can effectively lose its attractiveness for a company even after 115 years of history. After its merger with Chrysler, Fiat relocated its headquarters from Italy to the Netherlands and the UK in 2014, taking advantage of framework conditions that are more attractive for

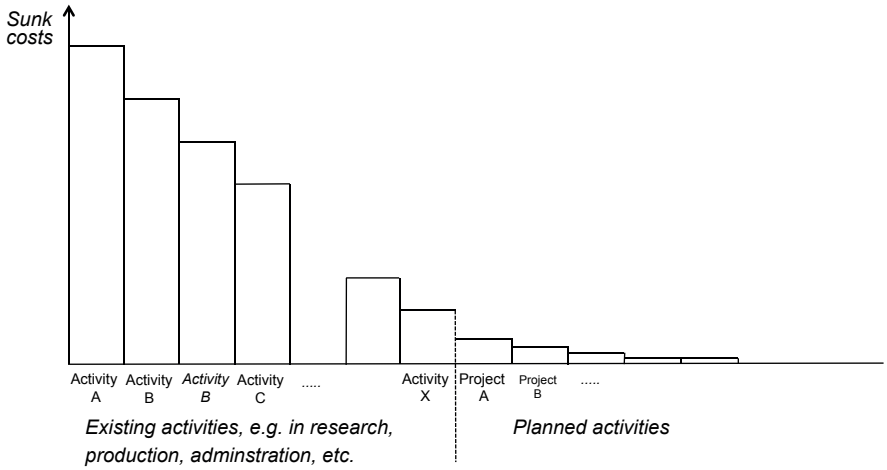
10 See the discussion in Baier and Hauser (2013).

headquarters. It remains to be seen to what degree the current appreciation of the Swiss franc pushes companies over the threshold in the sense that the cumulated effect of past negative events makes the Swiss location unattractive.

In contrast to such big and visible relocation decisions, companies decide every day about locations for new investments. Updated information or uncertainty about framework conditions are immediately considered in the case of new projects, because the sunk costs are still low or non-existent. Only limited resources have already been spent on the project, which means that reversing or re-evaluating it at such an early stage is relatively inexpensive. For previous investments the opposite is the case. The sunk costs are considerable and relocation with renewed spending of fixed cost at the new location becomes justifiable only if the framework conditions change considerably.

This argument is demonstrated for a general case in Figure 4; activities are ordered on the x-axis according to funds that have been already allocated to existing or planned projects. These sunk costs are systematically higher for existing activities than for new investments, thereby leading to new activities reacting faster to changing framework conditions. However, these reactions are also less visible to the general public. This leads to a bias in the perception of how firms' decisions are affected by framework conditions and creates the impression that firms are not reacting, despite the fact that unobservable reactions are going on.

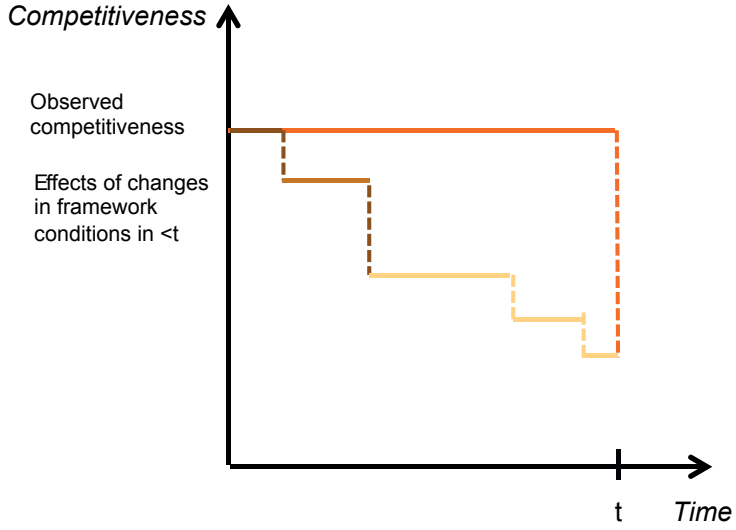
Figure 4: Fixed cost: The perspective on relocation decisions and new investments



Note: Existing and planned activities ordered by descending sunk costs.

The structure of the reactions of firms leads to the conclusion summarized in Figure 5. It may take several negative changes in framework conditions for the reaction of firms to become observable. Once the reaction does take place, it is perceived as reflecting an abrupt fall in competitiveness. At this stage, the possibilities to positively influence competitiveness in the short and medium term are limited because of the time lag between policy actions and their impact (the first dimension of stickiness). The sunk costs of shifting activities will lead to a new situation of stickiness. In the medium term, firms are expected to continue activities in the new locations until major changes occur that can reverse the assessment of competitiveness again in favour of the initial location. Following this argument, we can say that the probability of Fiat relocating its headquarters back to Italy is low in the short and medium term.

Figure 5: Many changes of framework conditions can occur until a visible adaptation of competitiveness becomes visible



According to Dixit and Pindyck (1994), there are three important characteristics of investment decisions that help to analyse and predict the investment patterns of companies. As the authors show, most investment decisions are irreversible, regardless of whether or not they are industry-specific. Besides this *irreversibility,* firms also consider *uncertainty* about future rewards and the *timing* of investment. Thus, a firm will be aware of the fact that the cost of an investment cannot be recovered, it will compare potential investment rewards for alternative projects, and will postpone an investment if valuable additional information can be gained by waiting. Irreversibility contributes to the stickiness of location decisions because

it minimizes the number of decisions that are revised if framework conditions change. But as far as new investment decisions are concerned, competitiveness of the home location is important for all three dimensions. Worsening framework conditions increase the uncertainty of future rewards, make future information valuable for the decision, and mean that an alternative country is potentially more attractive because of the irreversibility of the investment.

Variation in fixed costs and in resulting time scales for the reaction to a changing environment exists not just between existing and planned activities. Figure 4 shows an exemplary distribution of fixed costs in which R&D and production are usually associated with higher irreversible costs and slower reaction times than headquarter functions. Typically, fixed costs are higher for those functions that require investments in equipment, while for headquarter functions (which are mostly administrative) these costs will be lower. But of course not every industry – or function – is dependent on the same framework conditions. While tax laws or industry-specific regulations might be important in one case, the availability of qualified labor might be decisive in another. This is why different shocks to competitiveness will impact industries (and functions) in different ways.

To demonstrate the influence of competitiveness on company decisions, we return to the example of the recent Swiss referendum. A publication by a Swiss economic consultancy (BAK Basel, 2014) identifies four major consequences of the initiative "against mass immigration": uncertainty, shortage of qualified labor, lack of access to the EU market, and negative consequences for the country's innovation capabilities because Swiss-EU research exchange programs may well cease. All four aspects will influence the competitiveness of Switzerland, either through their implications for productivity or by making Switzerland less attractive for mobile factors (in particular, qualified labor). However, a company's investment decisions will not take into account all four consequences. Before the details of the negotiations with the EU are known, only uncertainty will play a part in such decisions. The extent to which the other consequences will put pressure on the framework conditions will become clear only after the initiative has been implemented and a new agreement with the EU is reached. In the meantime the initiative will not change the status quo. Investments in the country are not revised, as a consequence of which there is no visible effect on competitiveness (yet). In the background, decisions that have to be made are reconsidered and possibly decided, without visibility, in favor of alternative locations.

The described time lag in the reaction of business to changes in framework conditions and the perception thereof make competitiveness even stickier. This second dimension of stickiness can be visualized by the metaphor of a barrel: it not only takes time for policy measures to emerge from the pipeline, but their full

impact on competitiveness will only become visible when the barrel overflows and companies start to move ("overflow effect"). Or as the saying goes: it's the last straw that breaks the camel's back.

4.3 Reaction of policymakers

The third dimension of stickiness relates to the reactions of politicians. This dimension describes a time lag that amplifies the previous two dimensions of stickiness. Due to both of the effects described above, the general public and thus also politicians do not observe the worsening of competitiveness until a late stage. Once "the barrel overflows" and companies start to move out or employment measures start to deteriorate, the pressure on politicians grows. But if politicians react at this late stage, they not only have to accept a long time lag before any success of their decisions becomes visible; they will also have to accept that some effects of the worsening framework conditions can only be reversed at great effort, if at all.

The active management of competitiveness is more promising if it considers these three dimensions of stickiness. If it does not, then policy risks being ineffective and lagging behind changes in competitiveness. The following section concludes by making proposals for improvements in policy and suggestions for further research.

5 Conclusions for policy and further research

The existing empirical literature on the relocation of business activities identifies framework conditions as a decisive factor that can lead to relocation,[11] but does not account for possible stickiness effects. This can be done by using existing data on relocation decisions and reassessing them using methods such as regression discontinuity models, that allow tipping points to be identified. These models make it possible to identify whether a small change in a variable suddenly has an enormous effect on some property of the analyzed system. The identification of such thresholds for different national and regional settings would add an important aspect to the understanding of location competitiveness and could have an impact on political decisions. A further possibility to test the stickiness hypothesis is the analysis of macro data on investment decisions. The share of the profits that are generated over a period of time and reinvested in the location can be used as a proxy for business reactions to framework conditions. Further research should verify whether the share of reinvested profit can be used as a

11 See, for example, Birkinshaw et al. (2006) on headquarters.

leading indicator for relocation decisions, which in this case could be integrated into a forward-looking competitiveness measure. The stickiness hypothesis could also be tested by conducting a survey among multinational companies, with the three dimensions of stickiness distinguished in the survey in order to ascertain their relative importance.

In any case, stickiness should be considered in any forward-looking economic development policy. Competitiveness policies should take into account all three above-mentioned dimensions of stickiness to prevent major damage to a country's competitiveness. This is especially relevant in a small open economy like Switzerland, as the relatively small size of the home market compared to exports amplifies the effects of changes in framework conditions on competitiveness.

For each dimension of stickiness, policy measures should be considered which help policy makers to react in time to important changes of framework conditions, thereby alleviating the negative impact of worsening circumstances.

First, politicians should be aware of the first dimension of stickiness (manifestation) and systematically analyze which policy measures that are already "*in the pipeline*" will impact future competitiveness. An estimation of the impact of these measures should also be conducted in a structured way through comparative methods or surveys to adequately assess the risks involved.

Second, in order to anticipate the reactions of business, competitiveness policy needs to analyze the sensitiveness of the country's industries and companies. An identification mapping of the different sensitivities to changes in concrete framework conditions can be used to define policy measures and priorities. Politicians should be especially cautious when regulating aspects that are crucial for important industries or for functions/industries that are internationally mobile. Additionally, policy makers should investigate the investment decisions of domestic and foreign companies in order to identify reactions on the margin – changes in planned investment or new projects, for example – as early as possible. Resulting observations should be used as an early warning system for the management of competitiveness.

Third, politicians should be made aware of the stickiness of competitiveness. The horizon of competitiveness indicators has to be expanded. The measures described above have to be included in the measurement of competitiveness in order to increase the transparency of the "pipeline". New policy measures should then be benchmarked against this pipeline. The key question here is whether current plans for policy actions alleviate or exacerbate the effects of measures that are already in the pipeline but that have not been felt yet. Ideally, this increased

transparency of the pipeline will allow policy measures to be tailored adequately and prevent inadvertent damage that may arise simply because the full extent of decisions already taken is not yet visible.

Of course, these measures are not a cure-all; uncertainty and risk are quintessential features of the future. But it is paramount to use the information available to at least minimize the inherent risk. Given the non-linear dynamics of investment decisions, even minor improvements in transparency and anticipation can bring major benefits. Once a tipping point is reached, the damage to come can only be compensated with a lot of effort, if at all.

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